

FOUNDED IN 1978

INNOVATION WORLD

Front-end development tools

Some tips for choosing the right tools for your environment. **See page 37**

Desktop PCs without the 'Intel inside'

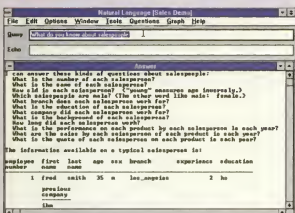
We evaluate several machines powered by AMD, Cyrix, and IBM chips. **See page 48**

FEBRUARY 8, 1993

THE VOICE OF PERSONAL COMPUTING IN THE ENTERPRISE

VOLUME 15, ISSUE 6

First Look / Kevin Strehlo



Natural Languages for Windows guides users as they retrieve data from SQL databases by asking questions in English.

Database front end for Windows speaks users' native language

Given their druthers, users would ask for data in English and not in the twisted, unnatural syntax of SQL or via the confusing check boxes and linking tools of query tools.

Natural Language for Windows, a product that has been maturing for years on Unix and

VMS platforms, is now available to answer questions about large corporate databases on the PC platform. It's going to be a booming success, and it's long overdue.

The PC industry seemed to mix the idea of English access to data on the PC back in 1985

See FIRST LOOK, page 76

Next nixes hardware for software

By CATE CONCORAN
AND MARK STEPHENS

Next Computer Inc. will transform itself into a software company, ceasing production of its workstation line and laying off a large number of employees, sources said.

Redwood City, Calif.-based Next has decided to eliminate



the majority of its hardware engineers and production workers, sources said. In addition, the company may be forced to eliminate positions in other areas, sources added.

The company's work force numbers 540, and sources said layoffs of 60 percent are possible, though they may not all come at once.

Next is expected to make an official announcement about its restructuring plan soon, possibly this week, sources said.

A Next representative's only comment was that CEO Steve Jobs announced last year that the company

See NEXT, page 75

IBM will extend NetView with telephone monitoring

Plans to allow cross-country management via telephone

By JAYNE WILSON
AND SCOTT MACE

WASHINGTON—Within the year, IBM hopes to extend its NetView network management line to support everything from small LANs to cross-country enterprises.

Specifically, IBM demonstrated technology last week at ComNet here that allows NetView to "look through" telephone wires to monitor and manage a variety of far-flung computer resources, including data centers, application servers, and LANs, IBM representatives said.

The technology is especially useful to large national or international firms that do outsourcing for some of their computer resources, they added.

Under the new approach, NetView is linked to distant

See IBM, page 75

FTC delays action on Microsoft; ruling not expected to hurt firm

FTC decision could raise price of DOS, analysts say

By SHAWN WILLET

Whatever action the Federal Trade Commission takes following its two-year investigation of Microsoft Corp., analysts say it will have minimal impact on the company's financial health, but it could end up costing users.

FTC commissioners held a closed-door meeting Friday in Washington to discuss the staff's recommendations about possible legal actions against the Redmond, Wash.-based company. The FTC issued a statement, which did not men-

tion Microsoft by name, saying that no action was taken during the meeting.

Novell Inc., which has been preparing its own lawsuit against Microsoft, said the FTC "apparently decided not to decide. . . . We had never planned to wait for any action from the FTC in continuing with our business plan."

Microsoft said it will continue to cooperate with the FTC on the probe.

Legal experts believe the FTC might seek a restraining order barring Microsoft from cutting

See FTC, page 75

Dell to slash system prices by 22 percent

By STEVE POULI

Dell Computer Corp. this week is expected to cut system and peripheral prices as much as 22 percent on some products and will announce a variety of new support programs.

The price cuts, ranging from \$50 to \$500, will include peripheral, desktop, floor, and portable systems, with the largest dollar decreases expected on portable computers, said sources close to the company.

See DELL, page 75

Microsoft lures IS to NT with robust mail server

By CHERYL GERBER

To attract Fortune 500 companies to downsize on Windows NT, Microsoft Corp. has committed to making its LAN-based messaging server comply with an array of important standards.

A standards-compliant Enterprise Messaging Server (EMS) could let corporate users who have downsized retain the robust office automation and E-mail features of a mainframe while gaining the ease of a Windows PC desktop.

See MICROSOFT, page 75

Microsoft's Enterprise Messaging Server will support:

- Ethernet, TCP/IP, X.25 transports
- OSF DCE remote procedure calls
- Common clients, including Mac, Unix, Windows, and DOS
- Native X.500 and X.400
- Remote administration

Backup. For people who don't.



Everyone who uses a PC ought to back up regularly. But most people don't back up at all.

In fact, if the people you work with are like those working in most places we know, about the only way their data is going to get backed up is if it happens without them.

Guess what?

Now it can.

Now you can set up fully automatic, unattended backups for every PC in the house — DOS, Windows, Novell network servers, even Macintosh.

What's more, you can easily customize the nature and timing of each one to suit your specifications.

And transform a simple, effective backup policy from fantasy into fact.

All you need is Fastback Plus.

The world's most popular backup software comes complete with a backup policy of its own — in the form of pre-designed scheduling templates* — that you can adapt

more than 3MB per minute on an AT. Or up to 10MB per minute on a 386. No other Windows, Mac or Network



If automated, unattended backups aren't your style, you can still enjoy unprecedented convenience with our Express Menu, which InfoWorld considers "only slightly more complicated than an on/off switch"

version can run fast enough to see our tail lights.

And nobody else comes close to our level of reliability.

You can destroy as much as 11% of the data on a diskette and Fastback Plus will recover every last byte, error-free. Unbelievable?

That's what the people at *InfoWorld* thought.

So they "scratched both disks with the point of a knife to simulate accidental damage" and discovered, to their astonishment, that Fastback Plus "was 100% successful at restoring all the [damaged] files."

Still unsatisfied, they "ran the test several more times, increasing the severity of damage until we began to fear for our disk drives, but we were unable to generate a single byte of unrecoverable data."

We wouldn't recommend trying this test yourself. But if you insist, you'll be glad to know that Fastback Plus is backed up by our vaunted 24-hour toll-free technical support and a one-year money-back guarantee.

There's more. So pick up the phone. Dial 1-800-759-2815.

And tell everyone to stand back.

*Scheduling templates included in DOS, Windows and Network versions.

with our unique Macro Editor.

What makes our Macro Editor unique?

It uses plain English commands. Which means you can actually use it.

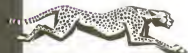
Using Fastback Plus on a PC — same look, same functionality.

Same backups, even.

That's right. You can actually restore a Macintosh file directly onto a PC, and vice versa.

Nobody else can do that.

But then, nobody else can back up



FIFTH GENERATION SYSTEMS, INC.

NEWS

Users forcing fixes to Word for OS/2 bugs

By DOUG BARNES

Angry corporate OS/2 users have pressured IBM and Microsoft Corp. to stop pointing fingers and resolve the problems with Microsoft Word for OS/2 1.1b.

Users said Word crashes when running with IBM OS/2 2.0 with the Service Pak — which is necessary to run newer OS/2 applications. Word also has problems printing more than one page of a file, said sources at American Airlines and Travelers Insurance Co.

"It is an OS/2 memory allocation issue," said Taylor Collier, product manager for Microsoft Word, last week. "If a fix is found before [OS/2] 2.1 [ships], we will make it available," he said.

However, Microsoft now says that IBM has found memory allocation problems with the Service Pak, which will be fixed in OS/2 2.1, which sources say will ship this spring.

As of press time, IBM declined official comment.

Microsoft and IBM have blamed each other for the Word problem, according to an IS manager who supports some 3,000 OS/2 users and who uses Word as the standard OS/2 word processor.

According to an internal IBM technical analysis, Word violates OS/2 programming guidelines, causing it to break under the Service Pak.

Word for OS/2 has worked under OS/2 1.3 and OS/2 2.0 without the Service Pak, users said. But there are problems with pasting text into a Windows application, and Dynamic Data Exchange with a Windows application locks the system, one manager said. The glitches are blocking a major insurance firm's efforts to upgrade to the latest version of OS/2, he said.

The incompatibility is a sore spot with the customer, who bought into OS/2 when it was being actively pushed by Microsoft and now feels the firm has abandoned both the operating system and the applications.

"[Microsoft] would just as soon switch [Word for OS/2] down and have people use Word for Windows," the user said.

Switching to the Windows product, as Microsoft has suggested, causes performance loss and requires macros developed for OS/2 to be ported to Windows, he said.




Apple seeds market with new products

Product	Specifications	Price
Color Classic	Built-in color monitor, 16-MHz 68030, 4MB of RAM, 80MB hard drive	\$1,400
LC III	25-MHz 68030, 4MB of RAM, 80MB hard drive	\$1,400*
Centris 610	20-MHz 68180 or 68040, 4 to 8MB of RAM, 80 to 500MB hard drive, optional EtherTalk and CD ROM	\$2,400* to \$3,000
Centris 650	25-MHz 68040, 4 to 8MB of RAM, 80 to 500MB hard drive, optional EtherTalk and CD ROM	\$2,700* to \$4,000
Quadra 800	33-MHz 68040, four slots, 8MB of RAM, 230MB to 1GB hard drive, optional CD ROM	\$4,500* to \$6,500
PowerBook 165C	33-MHz 68040, 4MB hard drive, 9-inch passive matrix color screen	\$3,600

*Price does not include monitor or keyboard.

At Macworld Japan this week, Apple Computer Inc. will launch six systems, including the new Centris line, all priced to please users.

A virtual reality developers' kit is coming from Autodesk

By KELLEY DAMORE

Autodesk Inc. this quarter will bring virtual reality to the CAD market, starting with the introduction of a developers' kit, according to sources close to the company.

Autodesk's multimedia division, known to be working on a commercial virtual reality product called Cyberspace, has been conducting this research and development for the last four years.

The research includes development of a three-dimensional user interface that can be incorporated or linked to its AutoCAD line, said Richard Dym, general manager of the multimedia division.

The company would not comment on reports it will release a developers' kit.

"There is a huge installed base of CAD customers that could use multimedia visualization and 3-D rendering," Dym said. "Our strategy is to develop additional products for the design automation world."

Autodesk has demonstrated a virtual reality technology

showing users in a building and creating new walls or a door, Dym said.

"This is done interactively and shows virtual reality actually being used for something that is practical," Dym said.

Other developments at Autodesk include an animation utility that the company said will be introduced later this year. The product, for the Windows and DOS markets, will let users create and play back animation from within business applications. These animations will be usable in any application that supports Object Linking and Embedding (OLE), said Alison Ishimaru, a senior product marketing manager at Autodesk.

Autodesk said innovations such as the Pentium chip will improve the rendering process for 3-D visualization and animation, making it more attractive to a broader base of users.

It currently can take 5 to 30 minutes to render one screen — or one-thirtieth of a second of animation. The Pentium chip could improve floating-point performance fivefold to tenfold, Intel officials said.

AT DEADLINE

NextStep 486 late beta scheduled to ship in May

Users waiting for NextStep 486 can get a beta version in late May with everything except a complete driver set, a Next representative said. The late-beta release will coincide with NextWorld Expo, scheduled for May 25 in San Francisco.

An earlier beta version is shipping now, and the final version with a complete set of drivers is due sometime in the third quarter, she said. "We're taking orders now," the official said. "People are very interested in the 486 product." The company plans to port NextStep to the Pentium as well as to other hardware platforms, based on volume and customer interest, but has not yet decided which ones, the official said.

— Cate Corcoran

Aldus reports weak fourth quarter

Aldus Corp.'s earnings for the fourth quarter were \$1.9 million, compared with \$4.5 million during the same quarter last year. The Seattle-based vendor has announced disappointing results six quarters in a row and said year-end revenues declined more than 70 percent to \$6.8 million from \$23.8 million. Aldus attributed its poor annual results to a variety of factors, including increased spending on sales and marketing promotions, additional research and development, and a one-time cost for second- and third-quarter restructuring.

In other news, Aldus announced that it named Kenneth Grunzweig to be vice president of marketing. Grunzweig had been a vice president at Lotus Development Corp.

— Jeanette Borzo

Novell warns to Sun RISC hardware

Novell Inc. and Sun Microsystems Inc. are expected to divulge plans for shipping a version of NetWare for Sun's Sparc RISC microprocessor, a project that sources said has been under development since mid-1992. At the February 10 announcement, Novell CEO Ray Noorda and Sun president Scott McNealy are also expected to announce other joint initiatives for improving interoperability between NetWare and Unix networks, according to sources familiar with the plan.

The Novell-Sun announcements mark a high watermark in relations between the two firms, observers said. They are warning as Novell completes its acquisition of Unix Systems Labs and Microsoft Corp. prepares to ship Windows NT. "You're seeing the beginning of Novell starting to reach out to Sun and other Unix vendors to actively unite against Microsoft and Windows NT," said one analyst who had met with Novell officials late last week.

— Vance McCarthy

Comdisco to offer PC management

Comdisco Inc. will release in March a software package that allows users to order, track, and manage PCs and other hardware electronically. Class for Windows 3.0 also includes an on-line Financial Analysis Support Tool (FAST) that allows users to perform financial analyses against their database of asset information, including book and tax value calculations. Users can also customize the depreciation methods in the FAST module. Class for Windows 3.0 will retail for \$8,000; users with earlier versions can upgrade for free.

— Jim Hammett

Enterprise Computing adds columnist

Firm in the belief that you can never have too much of a good thing, *InfoWorld* this week is pleased to add to its roster of Enterprise Computing columnists. David Strom, former editor in chief of *Network Computing*, becomes our latest addition to the section, complementing Cheryl Currid's New Age IS with *The Network Curmudgeon* (see page 44). Strom, who has also made networks run for a living, plans to take a real-world look at technologies and trends, as well as go into some head-to-head debates with Cheryl Currid.



Distributed Thinking / Stewart Alsop

Demo 93 proves there's some innovative life left in the industry

Demo 93 is designed to bring together only the newest and most interesting products in the

personal computer industry so that people who really care about the whole industry don't have to go to every trade show to see what's new in product design and technology. To the degree that we're successful, Demo ends up being a real snapshot of the personal computer industry. (In the interest of full disclosure, InfoWorld Publishing Company owns and produces Demo 93, and yours truly is the producer and program chair for the event. So take anything I say about the event with a grain of salt and just assume I'm telling you about it because I want you to go to it next year. That way, nobody can accuse us of trying to slip something past you.)

The key message of that snapshot is that this industry hasn't given up the ghost yet. It's fashionable to talk about how the PC industry has gotten so large and entrenched that it is no longer interested in making truly new and interesting products. The stuff from both large and small companies belies that attitude: The truth is that the industry is intro-

ducing innovative products in every major category and for every major marketplace in the industry.

Some of those categories:

PERSONAL DIGITAL ASSISTANTS

Lots has been said about PDAs but little has been accomplished. The major companies intending to participate in this category include Apple, Tandy, Panasonic, and Hewlett-Packard, not to mention Sharp, Casio, and every other large Japanese consumer electronics company. But the truth is that none of these companies has a product that actually works well enough to demonstrate in person. The only product at Demo was the Eo 440, which received its FCC authorization last month and is being manufactured for sale. (At lunch in an outdoor tent, I sent a fax and called my kids to leave them a message, all from a state-of-the-art computer in a package weighing not much more than 2 pounds. This is the way you want to do mobile computing.)

CLIENT/SERVER TOOLS

On the day of its initial public offering, Powersoft's stock went from \$20 to \$38. That same morning, we held a face-off at

Demo from Microsoft Access, Borland's Paradox for Windows, and Software Publishing's Superbase.

Let's see, Microsoft sold 750,000 copies of Access during its three-month promotional period; Paradox still accounts for most of Borland's revenues. Meanwhile, Powersoft reported sales of \$21 million last year (a leap from \$4 million two years ago). It looks as though customers are implementing client/server applications on PC networks in such volume that supporting products will become as big a business as PC-based tools have been in the past.

NETWORKS

Two of the six products introduced at Demo 93 were network related. Artisoft introduced an audio-conferencing server that allows people to hold voice-based meetings from their PCs (and eventually from telephones). And a new company called Coactive Computing Corp. has a way for small companies to set up physical networks without any specific support — no add-in cards, no specialized knowledge, and not much money (at \$149 per station).

Both of these products reflect some new thinking among vendors. No longer

amazed at how many networks are being bought, vendors today are assuming that networks are not universal.

PHONE CONTROL

At Demo 94, I hope we can show the Telephone Server for NetWare that AT&T and Novell jointly announced a few weeks ago. I think that one of the most exciting client/server applications is converting phone switches and voice-mail systems from proprietary standalone systems into standardized services on local area networks so that everybody can link up their databases and workflow systems with their telephone systems.

But it will take several years to develop the standards and infrastructure necessary to make this easy. In the meantime, we had two products (Octus from a company of the same name and Passageway from AT&T) that let the individual user integrate some of the features we've never been able to use before. One of the best lines at Demo was when Nolan Bushnell, the inventor of Pong and Chuck E. Cheese Pizza and now chairman of Octus, said that his company wants to make your telephone as easy to use as your PC!

NEWS

IBM is trying to forge a bundling deal for OS/2 with Lotus.....**6**

AT&T plans a vast ATM backbone to be activated by 1994.....**8**

Claris reads MacWrite Pro and Glans-Works for Windows.....**8**

Six vendors show cutting-edge technologies at Demo 93.....**8**

Media Vision to ship an entry-level video capture and compression card.....**8**

Dell's Performance series has a bug affecting Lotus 1-2-3, Release 3.1.....**75**

SOFTWARE
Looking Glass will offer a low-priced three-dimensional rendering tool.....**13**

Claris woos Q&A users with its File-Maker Pro Translator.....**13**

ObjectWorld features hot object-oriented development tools.....**16**

Stanford Graphics update is drawing beta raves for its speed.....**16**

YourWay 3.0 contact manager includes drag and drop and a button bar.....**17**

SPSS for Windows is invaluable to the U.S. General Accounting Office.....**18**

Interleaf links documents across platforms, OSes, and applications.....**18**

HARDWARE

Japanese makers race to release high-tech flat-panel color monitors.....**23**

Micro Electronics' WinBook looks like a PowerBook but runs Windows.....**23**

RasterOps and Radius are losing the graphics and display market to Apple and SuperMac.....**24**

Logitech to launch SoundMan 16-bit sound card.....**24**

Unisys ships three 486DX2/66-based Unix servers.....**24**

Ricoh announces four optical storage drives and an alliance with Cori.....**25**

NETWORKING
The International Help Desk Connection gives software vendors a chance to aid help desks.....**29**

Tricord debuts SFT III servers for critical NetWare data.....**29**

Fiberbus ships a modular, multipoint bridge that links LANs to FDDI.....**30**

Trellis' Remark adds voice annotation to Lotus Notes documents.....**30**

Ungermann-Bass module lets any SNMP system control AccessOne.....**32**

The Coactive Mac-to-PC Connection is easily installed and inexpensive.....**32**

ENTERPRISE COMPUTING

We help you through the database application development maze with some tips for picking the right front-end tools.....**37**

MANAGEMENT
Decentralized decision-making is forcing IS managers to justify system development costs.....**39**

Alice LaPlante's case study investigates Colgate-Palmolive's global E-mail strategy.....**42**

IBM's PowerStation 355 is one of nine new RISC-based workstations.....73****



IBM's PowerStation 355 is one of nine new RISC-based workstations.....**73**

REVIEWS

PRODUCT COMPARISON

"Intel" isn't always inside desktop PCs: We test half a dozen alternatives.....**48**

REVIEWS
Visual Basic 2.0.....**57**

Toshiba Satellite lite notebook.....**59**

TEST DRIVES
PageMaker 5.0.....**77**

COLUMNS

Window Manager / Brian Livingston.....**18**

Tech Talk / Steve Gibson.....**25**

LAN Talk / Paul Merenbloom.....**33**

To the Editor.....**34**

From the Editor / Ed Foster.....**35**

Peer to Peer / Stan Polinsky.....**35**

From the Ether / Bob Metcalfe.....**36**

How to contact InfoWorld.....**36**

Help Desk / Brett Glass.....**43**

New Age IS / Cheryl Currid.....**44**

Network Curmudgeon / David Strom.....**44**

One on One / Bob Carberry.....**78**

Notes From the Field / Robert X. Cringely.....**78**

You
are
here.



You
are
here,
too.



Whoever said you can't be in two places at once?

One look at Microcom® Carbon Copy™ and you'll wonder how you ever got along without it. From home or on the road, control your office PC or LAN to check your e-mail. Use an application not on your notebook PC. Support PC users in other locations. Just think about the time and cost savings. And that's not all. Retrieve forgotten files. Transfer files. Download a report. Access information services. With Carbon Copy, it's fast and easy. Carbon Copy for DOS combines modem and LAN communications in one package for one low price. It is, without doubt, the best value in remote control communications. To buy Carbon Copy for DOS or Windows visit your local dealer.

Or for the dealer nearest you, call Microcom at

1-800-822-8224.

And see just how easy it is to be in two places at once. Over 800,000 people already use Carbon Copy.

Right now, when you buy Carbon Copy for DOS, you'll get Virex® virus detection software FREE. Offer good while supplies last.

Microcom's other PC connectivity products include: MicroPort™ and QX™ high speed portable and desktop modems, Relay® PC-to-mainframe communications software, Microcom Bridge/Router™ plug-and-play remote internetworking, and LANtard® for managing and supporting PCs on LANs.



microcom®

Microcom, Inc.
500 River Ridge Drive, Norwood, MA 02062-5028
(800) 822-8224; (617) 551-1000; Fax: (617) 551-1021
International Fax: (617) 551-1007

IBM looks to application bundles to add allure to OS/2

By Ed Scannell and Doug Barney

Looking to accelerate the acceptance of OS/2 in corporate accounts, IBM's personal software products (PSP) group is trying to force application bundling deals with major developers, including Lotus Development Corp.

IBM's PSP group proposed that

Lotus' direct sales force sell OS/2 2.x as a way of gaining entry to corporate accounts, where Lotus has already established a strong presence.

Lotus is the only major PC applications developer so far to commit to a broad suite of OS/2 applications. Lotus has yet to agree to the bundling deal or to resell OS/2 itself.

IBM and Lotus officials declined to comment on the reports.

Other vendors appear to be reversing OS/2 commitments. Borland International Inc., which has spoken of the operating system in glowing terms, steadfastly refuses to commit to any applications development.

Other vendors are hawking OS/2

reports, WordPerfect Corp., currently showing off WordPerfect, Version 5.2 for OS/2, which is a port of its Windows product, won't have a version that takes full advantage of OS/2 until late this year.

In what may be the best news yet for OS/2, Lotus began shipping this week OS/2-bit versions of 1-2-3 and Freelance Graphics. Lotus is now halfway to releasing a Smart Suite for OS/2 with cc:Mail and Ami Pro, set to ship in the next several months.

Meanwhile, as corporate users give the 32-bit operating system a closer look, many say they are hesitant to commit to it until there are more applications available that give them a reason to switch from DOS or Windows.

"A lot of people have been holding back, waiting for the 32-bit versions,"

Now Even Bad Reports Can Look Good.

New CA-RET™ 1.0: The Friendliest, Most Powerful Report Writer Ever.

Add bitmapped images anywhere in your report for graphic impact.

Create exciting output from your CA-Clipper, dBASE and text files.

Dozens of built-in number-crunching functions are available for powerful data analysis.

Whatever the news, make it look great with new CA-RET/Xbase, the visual report writer for Windows.

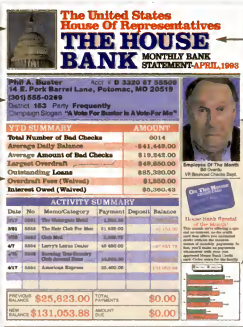
With drag and drop, WYSIWYG design, it's as easy to use as a word processor, yet powerful enough to produce



stunning results. Choose a wide variety of pre-formatted tabular layouts, labels and form letters—or create your own. Now you can add dazzling color, fonts and bitmaps to any report.

Place database fields, computed fields and aggregate computations anywhere and use the more than 40 built-in functions for extensive analysis.

And CA-RET's single-pass computation engine is the



Using different fonts adds pizzazz to your reports. CA-RET makes it a snap.

The allure of color: You get it in an easy, WYSIWYG environment.

You can even turn your data into eye-catching graphs.

most efficient available. From dBASE to Clipper, CA-RET/Xbase works with top databases (or text files) and acts as a DDE server so you



MICROSOFT WINDOWS COMPATIBLE

can include reports in other Windows applications. And the unlimited use runtime license lets you distribute report applications for free.

SPECIAL OFFER FOR R&R USERS.

Registered users of R&R Report Writer for Xbase can upgrade to CA-RET for just \$79 (\$89 in Canada). To order, just call 1-800-531-5236 (in Canada: 1-800-665-5449).

Call today and find out how easy it is to turn the mundane into the magnificent.

COMPUTER ASSOCIATES
Software superior by design.

© Computer Associates International, Inc. One Computer Associates Plaza, Bala Cynwyd, PA 19004-1000
All product names referenced herein are trademarks of their respective companies.

Corporate users say they are hesitant to commit to the 32-bit operating system until there are more applications available.

said Hilmi Ozguc, senior product manager of 1-2-3 for OS/2.

"We believe that only about half of the copies shipped [of OS/2 2.0] are actually being used daily," said Brent Williams, director of PC software research for International Data Corp., in Framingham, Mass.

PSP's efforts to interest application developers in bundling deals appears to some to be working in parallel with similar efforts with IBM's Personal Computer Co. (See "IBM may bundle OS/2's best applications with its top PCs, January 25," page 3.)

Because PSP's charter is to evangelize OS/2, the unit is free to offer such bundles to other hardware OEMs competing against the IBM PC Co. Similarly, the IBM PC Co. is free to seek bundling deals, even with OS archival Microsoft Corp.

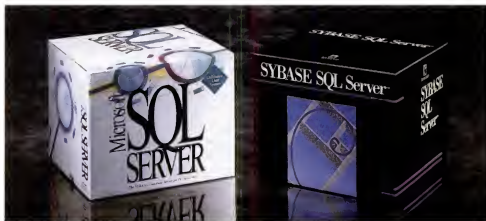
But cost is the biggest stumbling block in negotiations between IBM PC Co. and most developers, sources said.

The royalties IBM would have to pay developers for bundling would push the cost of IBM's hardware too high in what has become a vicious price-competitive market over the past six months. And if IBM does not give vendors, such as Lotus, a direct return, these deals cannot be struck.

For the record

In the article "UPS systems run under SNMP, allow remote management," February 1, 1993, page 38, the phone number for Oneac Corp. is incorrect. The company can be reached at (708) 816-6000.

Here's Everything You Need To Know About Windows-based Client/Server Computing.



SQL Server is available from Microsoft and Sybase on OS/2 and Windows NT. SQL Server from Sybase is also available on popular UNIX, VMS and NetWare operating systems.

IT'S CALLED SQL SERVER™ The leading client/server database for enterprise-wide applications.

It's from Microsoft® and Sybase. Creators of a new class of software that combines the ease of Windows-based computing with the power of the most advanced client/server architecture.

Already, thousands of customers are using SQL Server to create a new generation of applications—scalable from PCs to mainframes—that integrate, manage, and deliver critical business information to users of Windows across the enterprise.

SQL Server supports more Windows-based applications and tools than any other database server. And it's the foundation of a complete family of database, connectivity, and application development tools from Microsoft and Sybase.

We've prepared a special information kit on Windows-based Client/Server computing to help you get started. And to get it, there's just one more thing you need to know. Our phone number: 1-800-332-4838.

Microsoft® SYBASE®
Windows-based Client/Server Computing

© 1992 Microsoft Corporation and Sybase, Inc. All rights reserved. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. SQL Server is a trademark of Sybase, Inc. Other trademarks or registered trademarks are the property of their respective holders.

This One



EDHD-GS6-44Z1

Circle 10 on Reader Service

AT&T plans vast ATM backbone by '94

By JAYNE WILSON

WASHINGTON — Telecommunications giant AT&T last week leapt on the Asynchronous Transfer Mode bandwagon, unveiling at ComNet an open network architecture that will be the basis of a new service.

AT&T's ATM service, due in 1994, will be set up much like conventional telephone services; customers will be able to

hook into high-speed data transfer services with their own equipment or rented AT&T products, said Jayne Fitzgerald, product line manager for high-speed services.

COMNET

Once on-line, customers are tapped into a switching backbone that routes traffic at speeds ranging from 150 to 600 megabits per second.

"The ATM market will likely evolve in phases, starting with power users, moving to a pri-

vate LAN/WAN backbone, to public WAN backbones, and possibly onto the desktop," said Greg Cline, analyst with International Data Corp., in Vienna, Va. "I believe [ATM] will reach critical mass by 1995."

AT&T's ATM approach will let customers manage their ATM-linked resources on their own through a connection to AT&T's centralized Data Network Operations Center.

The ATM architecture arose from collaboration with third-party hardware vendors,

AT&T officials said. It will employ BPX switches from Stratacom Inc. and the GCNS-2000 high-capacity switches from AT&T's Network Systems unit, which support data transfers beyond 1 gigabit.

AT&T will also use Cisco Systems Inc.'s 7000 router. AT&T has formed a customer advisory council to help determine features and pricing for ATM, said Joann Patrick-Ezzell, vice president of marketing for data communications services.

MacWrite Pro, ClarisWorks for Windows on tap

By JEANETTE BORZO

INDIAN WELLS, Calif. — Two new Claris products are due to ship in the next two months, Claris officials revealed at Demo 93 here last week.

MacWrite Pro, a new word processor, is due to ship in March for approximately \$249, and ClarisWorks for Windows is expected to ship late in April, the company said.

MacWrite Pro will be about 18 months late but will offer significantly more power than the MacWrite II product it will likely supersede.

MacWrite Pro offers 130 new features including functionality for tables, mail merge, on-line help, text-wrap around frames, and paragraph and character style sheets. Users can create multiple headers and footers, anchor text to graphics, create multiple columns with one click, and import and export more than 50 file formats.

The Macintosh System 7.5 savvy product will offer Balloon Help, Publish and Subscribe, and AppleEvents. Upgrades for current MacWrite users will cost about \$69. Recent Macintosh counterparts, ClarisWorks for Windows will offer word processing, spreadsheet, database, charting, and graphics functionality.

ClarisWorks for Windows will rely on Windows' terminal accessory for sending and receiving documents and will cost \$249 — \$50 less than its Mac counterpart.

In other news, Claris said it will return product development of HyperCard to parent company Apple Computer Inc. Apple said it will coordinate HyperCard development with AppleScript, its technology for integrating applications that is scheduled to ship by June.

Demo 93 has high tech with low funds

By JEANETTE BORZO
And TONY QUINN

INDIAN WELLS, Calif. — Industry executives were impressed but skeptical last week at Demo 93, where six mostly small or new vendors showed cutting-edge technologies.

Interest was flagged somewhat by the products' questionable chances for success with limited finances in markets that are already crowded.

The companies and their "Premiere" products included: Arabesque Software Inc. and Echo; Artisoft Inc. and Kiva Net Conferencing; Coactive Computing Corp. and the Coactive Connector; Lundeen & Associates and Words & Beyond; Nomadic Systems Inc. and SmartSync; and Watermark Software Inc. and Watermark.

Products such as Coactive are due to ship next month, and others such as Kiva should be finished by the first quarter of next year. With the exception of Kiva, each product is the vendor's first major offering.

Lundeen's Mac-based word processing software captured favorable but reserved praise. Words & Beyond faces the dual challenge of being a small-venue product with limited financing while taking on market giants such as Microsoft

Corp., attendees said.

"That is such a cool product," said Roger McNamee, general partner at Integral Capital Partners, in Palo Alto, Calif. But when asked if the small Alameda, Calif.-based developer had the financial resources to bring the product to market, McNamee said, "The first thing they asked me was if I knew anyone who wanted to invest in them."

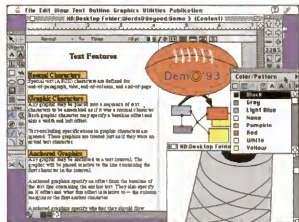
But there is always a demand for innovation, even if the market is slow to recognize it, observers said.

The industry doubted WordPerfect years ago when it de-

buted against WordStar, said Will Fastic, vice president of Baltimore-based Alex Brown & Sons Inc.

"Sure, there's room for [Words & Beyond]. I like what I saw," Fastic said.

Other products demonstrated at the show include a technology for automated PC communications from Traveling Software, a tool for user interface design from UserLand Software Inc., a hardware/software technology that integrates telephone and PC communication services from Octus, and a pen-based technology for math applications.



The Mac-based Words & Beyond offers users a word processor integrated with graphics and desktop publishing features.

General Magic has huge firms under its spell

By YVONNE LEE

General Magic has been shrouded in mystery since Apple Computer Inc. spun it off in 1990, but it will unveil some of its sorcery at a press conference today in New York.

The Mountain View, Calif., software company will announce partnerships with some of the biggest names in consumer electronics, including Sony Corp., Matsushita Electric Industrial Company Ltd., Motorola Inc., and Philips Electronics.

General Magic's principal product, TeleScript, is a communications language that lets personal computers, larger computers, and hand-held devices pass "smart" messages across wired and wireless networks, said president Marc Porat. It will support various kinds of messages, including sound, voice, data, fax, and text.

"TeleScript is like PostScript — it actually gives instructions for how to process information," explained Portia Isaacson, president of DreamIT, who has been briefed on the announcements.

TeleScript lets users build systems that create the equivalent of call forwarding, allowing them to have messages sent to a preferred mail system, sent to an assistant during a vacation, or even discarded. TeleScript will also enable transactional messaging, such as ticketing and travel services.

The 4-by-5-by-1-inch prototype that General Magic displayed to potential hardware makers had a flip-out folding telephone receiver.

Sony and Motorola plan to build devices that run Magic Cap, General Magic's operating system, which embeds TeleScript. Philips and Matsushita have not committed to Magic Cap, although they will use TeleScript. Go Corp. has licensed TeleScript and will build a PenPoint.

Apple plans to add a TeleScript system extension for Macintosh, and it will eventually use it in Newton.

AT&T will embed TeleScript into its EasyLink Services, which will allow TeleScript-enabled devices to send messages across the service and will offer value-added services on the network.

Mead Data Central Inc., Sony Electronic Publishing, News Corp., and Intuit Inc. plan to offer services.

For TeleScript, TeleScript is invisible to the end-user because it interacts with applications rather than the user.

Compression board breaks \$400 barrier

By GATE CORCORAN

Computer users who want to create their own videos but have been stymied by the high prices of video capture and compression boards can look forward to an entry-level \$399 board shipping this month from Media Vision Inc.

"This is the first board to do compression and decompression and capture at such a low

price," said Jon Peddie, publisher of *PC Graphics Report*, in Oakland, Calif.

By year end, Media Vision hopes to get the street price of its Pro VideoSpectrum card down to \$150, or \$250 list, said Paul Jain, president.

The Pro VideoSpectrum board, which was announced in December, uses off-the-shelf chips to capture, compress, and save video to the hard disk in

real time. The board uses the same compression algorithm Media Vision created for Microsoft's Video for Windows.

On a 486, it displays video in a 160-by-120 window at 15 frames per second (fps). Jain said. The company hopes to ship in the fall a version based on a custom-designed, integrated chip or chip set that will play back video in a 320-by-240 window at 15 fps, he said.

According to Mr. Magoo, there's no trick to spotting a reliable monitor. You just pick one from a manufacturer that has met the stringent ISO 9000 series of standards for quality. And displays the ISO 9000 seal. The way Samtron does.

In fact, Samtron was awarded ISO's highest rating: ISO 9001.

One of the very few monitor manufacturers to ever earn it.

To achieve that rating, we underwent 1½ years of auditing ordered by the Geneva-based International Organization for Standards (ISO). Everything we do was scrutinized. From design and manufacturing through packing and shipping.

Their high rating means that, with the possible exception of advertising, they approve of what Samtron does. The way we train our people. The way we keep our records. Our management. Our delivery. Our overall product quality. About the only thing they weren't quite sure of was Magoo.

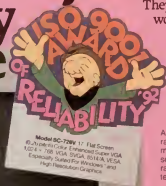
Gads, Two New Flat-Screen Monitors.

With our world-class ISO credentials clutched in hand, we present our new high resolution flat-screen, color monitors. The SC-528DX multi-mode 15" And the SC-726V, our 17" with 0.26 dot pitch. These monitors have pictures so big and so sharp that even Mr. Magoo's eyes can see them. All the way out to the corners. Without distortion. Which makes them ideal for viewing Windows™ or CAD/CAM.

If your needs are smaller look at our 14" EagleEye™ color monitor SC-428TX. With 0.28 dot pitch and 1024 x 768 non-interlaced resolution.

They're all monitors worth looking into. Even Mr. Magoo can see that.

**Now, Even
Reliability
Is Easy
To See**



Along with our ISO 9001 rating, our entire line of color monitors gets the Mr. Magoo seal of reliability. It separates the leader in monitor technology from the rest.

WE'RE WORTH WATCHING

SAMTRON

Samtron, 14251 E. Fillescone Blvd., Suite 101, La Mirada, CA 90638 Phone (310) 802-8425 Information San Jose (408) 970-8844, New York (201) 592-7900, Canada (416) 858-3000, Mexico 011-525-325-0993 Mr. Magoo © 1992 UFA Productions of America Windows is a trademark of Microsoft Corp

Why people who know aren't going anywhere

Over 18 million people use some version of Lotus® 1-2-3® every day. They depend on it. They trust it. They know it. Which is why, if they're moving from DOS to Windows™, they're moving to 1-2-3 for Windows . . . for some very good reasons.

They know that *only* 1-2-3 is fully compatible with 1-2-3.

Only 1-2-3 for Windows is able to read and execute every 1-2-3 for DOS file, style and macro. Which means you can preserve your full investment in 1-2-3 for DOS files when you move to 1-2-3 for Windows. And only 1-2-3 for Windows—with its built-in Classic® Menu—lets you use all your familiar 1-2-3 commands.

They know that 1-2-3 offers the *best* 3D technology.

Only 1-2-3's 3D technology gives you easy access to 256 worksheets and lets you build 3D formulas just like you do in 2D. Which ultimately makes consolidating, comparing and analyzing data much simpler. In comparison, Excel's Workbook™ is a limited imitation of true 3D. And while working in Group Mode in Borland's® Quattro® Pro for Windows, simply cutting a range of data in one sheet unfortunately means you'll delete the data on every sheet. And what's worse, you can't undo it. All of which means if the analytical power of 3D technology is important to you, 1-2-3 is still the best choice you can make.

They know that 1-2-3 for Windows now includes the *most asked-for* enhancements.

The new release of 1-2-3 for Windows Release 1.1 includes a number of performance enhancements. For example, it's now the fastest Windows spreadsheet for printing on PostScript® printers. And it's also the fastest to launch. We've also added over 25 innovative new features, usability enhancements and GUI development tools. The result? 1-2-3 for Windows is now more powerful and easier to use than ever before.

They know that 1-2-3 for Windows offers *unmatched* database capabilities.

It's true. If you're a spreadsheet user who needs to access external databases, 1-2-3 for Windows remains unmatched—particularly if you need relational capabilities. In fact, *Corporate Computing* (August 1992) recently wrote that "for the experienced 1-2-3 database user, 1-2-3 for Windows with DataLens® is the front-end tool of choice."

Now spreadsheets here without 1-2-3.

They know we're the *best*
company to do business with.

Not only do more people prefer our product, but according to the ComputerWorld Spreadsheet Brand Preference Study, more people prefer our company. And even more recently, the Information Technology Association of America announced that Lotus has been awarded its prestigious Quality Award recognizing outstanding customer service and customer satisfaction.

So if you're staying in DOS or moving to Windows or still trying to decide, remember one thing. That people who know spreadsheets are staying with 1-2-3. Call us today for your free demo disk at **1-800-TRADEUP, ext. 8399*** or visit your Lotus Authorized Reseller.



Lotus

1-2-3 for Windows

Same Old Line... All New Answers

MultiModemPCS™ with MultiExpressPCS™, Simultaneous Voice and Data on the Same Line at the Same Time... and Fax Too!

PCS

The
Personal
Communication
System
From
Multi-Tech
Systems.

When you're tired of hearing the same old line about single-function devices, look to Multi-Tech Systems MultiModemPCS™ and MultiExpressPCS™ for a fresh data, voice and fax solution for your desktop communication needs. Here's what you'll get...

Telephone: An on-screen "telephone", with headset, handset, or speaker phone operation, can initiate or receive phone calls at your PC. It is compatible with most PBX and Centrex systems that provide call forwarding, call transferring, and three-way calling. Features like speed dialing, call hold, and mute are also available under the "telephone" window. When you're away from your desk, the PCS can be set up to answer incoming calls and take voice messages after it shows your "greeting" file to the callers.

Show & Tell: The patent-pending features of the personal communication system from Multi-Tech Systems are pulled together in the voice-over-data communication program. When a call is set up using Show & Tell, you have a telephone connection and a 14.4K bps datacom connection over the same line, at the same time.

Fax Manager: Integrated "printer" drivers support high- and low-resolution faxing from your Windows™ 3.1 applications. Any document created under Windows can be "printed" to the outbound fax queue. Each document can be directed to multiple listings in the system "Address Book" - a user-defined recipient database. Outgoing faxes can be scheduled for immediate or delayed transmission. Incoming faxes are date- and time-stamped and then queued for viewing/printing.

Address Book: An integrated database system accessible by the Fax Manager, MultiMedia Mail, and Voice Mail programs to simplify and consolidate recipient information. Address books can be created and stored as separate files, which can be indexed to find vital information using the Hyper/Search indexing algorithm.

MultiMedia Mail: A message-composer and queue manager for handling documents with text, graphics, and voice annotations allows you to exchange visual and audio information between two PCs.

Voice Mail: The phone messages taken by your PCS are held in a queue just like an answering machine stores messages to tape. This queue manager includes a voice editing utility so you can remove unwanted portions of voice files and forward the "clean" files to your colleagues.



PATENT
PENDING

Now you can get more work out of your ordinary phone line with Multi-Tech's personal communication system (PCS). The sophisticated technology of the PCS combines a full-duplex, hands-free speaker phone with fax, data, and voice-messaging by integrating the multifunction MultiModemPCS modem with the new MultiExpressPCS software for complete business communications at the desktop. With its voice-compressing Vector Quantization™ algorithm, the packet-mode Multi-Tech Supervisory Protocol™ (MSP), and the quick-indexing Hyper/Search™ features, the personal communication system from Multi-Tech Systems delivers increased productivity using your existing phone line.

For more information, call 1-800-444-4444, ext. 100. Or write to Multi-Tech Systems, Inc., 10000 W. Alameda Ave., Suite 100, Denver, CO 80231.

Trademarks: MultiModem, MultiExpress, Vector Quantization, Multi-Tech Supervisory Protocol (MSP), HyperSearch, Multi-Tech, Multi-Tech Systems, Inc. (patent pending), MultiModem, Multi-Tech, Multi-Tech Systems, Inc. Windows, Microsoft Corporation. All other trademarks are registered to their respective owners.

MultiTech Systems

The Right Answer About Your

Multi-Tech Systems, Inc., 10000 W. Alameda Ave., Suite 100, Denver, CO 80231
Tel: 303-755-0800, Fax: 303-755-0801
International: 1-800-444-4444, ext. 100
Technical Support: 1-800-444-4444, ext. 100

©1994 Multi-Tech Systems, Inc.

NEWS / SOFTWARE

PIPELINE

SHIPPING

Zylmage provides document imaging

Zylab and Calera Recognition Systems Inc. have collaborated on a document imaging package. Zylmage for Windows provides scanning, image management, optical character recognition features, and full-text search and structured data retrieval. The single-user version is priced at \$795. A network version is also available. (800) 544-6339.

Great Plains Software shipped its Great Plains Dynamics LAN-ready graphical accounting and business management application and the Dexterity cross-platform development system. The modular software for Macintosh and Windows allows users in different computing environments to share data seamlessly across a network. Modules are priced from \$500 to \$1,500. (800) 456-0025.

Hertzler Systems Inc.'s QTrack Connect Action and Inspection System is a quality assurance package that allows businesses to gather and analyze customer complaints. The Windows product costs \$895. An unlimited network license is available for \$4,400. (219) 533-0571.

Ross Systems Inc. released Renaissance CS Series, a suite of accounting programs designed for open systems environments and client/server processing. It is available for Open VMS, VMS, Ultrix, and HP-UX. The client component, scheduled to ship in June, will support Windows 3.x, Macintosh, and Motif. Pricing is based on system configuration. (415) 593-2500.

UPGRADES

Lucid 3-D update includes templates

Lucid Corp.'s Lucid 3-D 2.6 is an updated version of the three-dimensional linking spreadsheet. It now offers Fast Forms, which are ready-to-run templates for a variety of personal and business applications. It retails for \$179.95. (800) 925-6243.

ANNOUNCED

No Hands to offer

DOs Common Ground No Hands Software's Common Ground enables users to view, print, and distribute documents created in any application. Windows and DOS versions will ship this summer. A Macintosh version is currently available for \$189. (800) 598-3821.

Cheetah 3D offers high-end rendering at low-end price

By JEANETTE BORZO

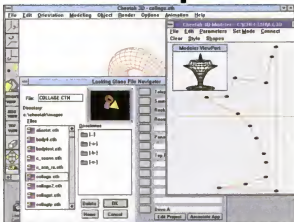
A new three-dimensional rendering application from Looking Glass Software Inc. gives Windows users a variety of high-end features at a low price.

Cheetah 3D, priced at \$349.95, features Phong, Gouraud, and flat shading; multiple light sources; four viewing modes; selective ray tracing; and limited modeling and animation modules.

A file navigator feature lets users organize their work into projects and provides an easy way to delete, move, and copy objects.

"It's PC-based, it works with Windows, and it's low-cost," said beta tester Wes Procinio, an optical engineer at TRW Inc. in Redondo Beach, Calif. "For \$350, it's a great value," he added.

Targeted for use with multimedia applications rather than CAD applications, Cheetah 3D offers a variety of time-saving features such as the option to render or shade only a specific area of an image; the option to turn off the auto-redraw function; and the option to work in a variety of resolutions.



The Windows-based Cheetah 3D offers users a File Navigator in which they can move, delete, and copy files.

"By choosing a lower resolution, later I'll set up a batch job to change the files to a higher resolution so I don't have to sit there waiting," Procinio said.

"Everybody gets exasperated with redraw time, but it didn't bother me because [with Cheetah 3D] I can turn it off," said beta tester Devra Hall, owner of Devra Enterprises, in Glendale, Calif.

Hall said she liked the prod-

uct's access to the most commonly used functions in a button bar along the left side of the screen.

"I didn't need to go to the menus until I wanted to do something more advanced," Hall said.

The product is due to ship by the end of the month.

The Inglewood, Calif.-based Looking Glass can be reached at (310) 348-8240.

Clarisc breaks Windows barrier

Translator replicates Q&A files to FileMaker Pro

By SCOTT MACE

Users of Symantec Inc.'s Q&A database manager for DOS—who have no immediate prospects for a Windows version—are being wooed by Clarisc Corp., maker of FileMaker Pro for Windows.

InfoWorld Editorial Products is a sponsor of the Demo '93 industry conference.

The Translator replicates Q&A 4.0 fields, data, and forms directly into FileMaker Pro 2.0 for Windows files. Upon opening a translated Q&A file in FileMaker Pro, the new Win-

dows environment with the FileMaker Pro Translator," said Dick Gorman, vice president of worldwide marketing for Clarisc.

Following translation of Q&A files, the Translator generates a log that documents details about the conversion of each file. Users can scroll through the file on-screen, print it, or save it to a text file for later reference.

All original Q&A files remain intact in their original location. The newly created FileMaker Pro files work seamlessly across Windows and Macintosh computers without additional modification, the company said.

Through June 1993, Clarisc is offering a \$99 competitive upgrade from Q&A to FileMaker Pro 2.0 for Windows, including the Translator at no extra cost. The Translator will also be distributed by Clarisc to owners of Q&A 4.0 at no cost over America Online and CompuServe.

The Santa Clara, Calif.-based Clarisc can be reached at (408) 727-8227.

"Finally, Q&A users will have a smooth migration path from DOS into the Windows database environment."

Dick Gorman

Last week at Demo '93, in Indian Wells, Calif., Clarisc announced shipment of the FileMaker Pro Translator, which lets Q&A 4.0 users easily transfer their database files and forms to FileMaker Pro 2.0 for Windows.

dows file creates the same look, layout, and data as the original Q&A file. At the same time, users gain new Windows capabilities.

"Finally, Q&A users will have a smooth migration path from DOS into the Windows data-

NSL unveils update for OSF/Motif

By KELLEY DAMORE

Non Standard Logics Inc. recently released a new version of XFaceMaker, its graphical user interface builder for the OSF/Motif platform, which allows users to build application interfaces and create widget classes for the interfaces.

Widgets are objects such as push buttons, labels, and text fields.

XFaceMaker, Version 2.0 includes the WidgetMaker, which builds personalized classes that can be used with toolkits for Motif and Open Look, as well as other toolkits that are not fulfilled by existing widget sets.

The widgets can be assembled into objects with assigned inheritance and reusability. This frees the user from working with standard Motif and Open Look toolkits, according to company officials.

In addition, XFaceMaker 2.0 includes a class-making facility, an advanced resource editor, a C-like scripting language called Face, and a test mode that enables developers to test interfaces while they are being built.

The updated version enables users to edit menus through a dialog box, print the interface and widget in PostScript, and move and change the class of a widget.

XFaceMaker 2.0 requires a minimum of 8 megabytes of RAM, as well as Version 1.1 of Motif.

XFaceMaker is available on most Unix platforms, including Sun Microsystems Inc., Hewlett-Packard Co., Digital Equipment Corp., IBM, SCO, and Univel.

XFaceMaker is priced at \$4,995 and is available directly from the company.

An entry-level version that lacks templates and the WidgetMaker is priced at \$3,495. Non Standard Logics officials said.

The company also unveiled a \$2,500 WidgetLibrary, a collection of custom and general-purpose widgets.

An entry-level version in the WidgetLibrary is the XnsIDraw widget. XnsIDraw allows a designer to add graphic aspects to a window object and assign it functionality.

XFaceMaker 2.0 is available now.

Non Standard Logics is based in Boston and can be reached at (617) 482-6393.

It's not surprising WordPerfect Microsoft Word for Windows



At last count, more than half a million WordPerfect® for DOS users have moved to the number one word processing software for Windows™: Microsoft® Word version 2.0

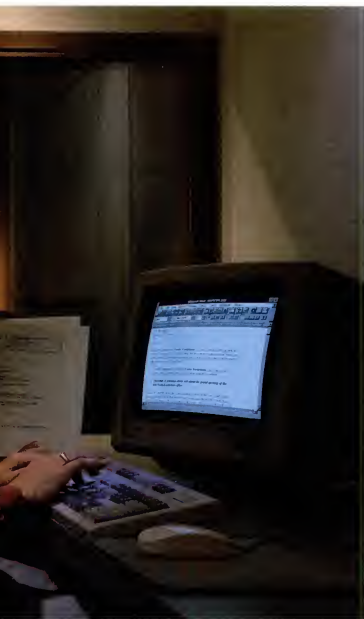
for Windows. And there are plenty of good reasons why.

First of all, WordPerfect for DOS users actually helped us to make Word for Windows easier to use.

During the development of Word for Windows, we invited WordPerfect

*Each year shows approximate total number of users who have switched. For more information inside the 50 United States, call (800) 426-9400, Dept HYP. Outside the U.S. and Canada, call (206) 936-8661. Customers in Canada, call (416) 764-2400.

Perfect users are switching to Windows. They helped define it.



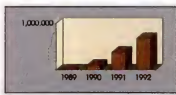
users to try it out on the things they do every day at work. We call these types of sessions "usability studies." They help us find out the way in which people use their computers, and how we can make it easier for them.

In this case, we were able to de-

sign features that can make not only your everyday work easier, but also the transition from WordPerfect.

Like the customizable Toolbar. It gives you one-step access to inserting bullets and printing envelopes. Word for Windows can also take all your famil-

From November 1989 to August 1992, over half a million WordPerfect users have switched to Microsoft Word for Windows.



ar commands in WordPerfect, and then display the equivalent commands. So you can learn while you're working on your everyday tasks.

We even had the National Software Testing Labs put Word for Windows to the test in ten cities across the country. The result was that nearly 8 out of 10 WordPerfect users preferred Microsoft Word for Windows for ease-of-use over WordPerfect for Windows.

But they're not the only ones who prefer Word for Windows. Recently, it received numerous industry awards, including "Best Buy" by *PC World*, and "Editors' Choice" by *PC Magazine*.

To find out how easy it is to make the switch to Word for Windows, just give us a call at (800) 426-9400, Dept. HY9. And then spread the Word.

Microsoft
Making it easier



Stanford Graphics 2.1 can analyze statistical data and graphically represent it.

Beta users like speedier Stanford Graphics update

By KELLEY DAMORE

Beta testers lauded the speed improvements in the latest release of 3D Visions' PC graphing package.

"The product has a lot more speed and more user configurable details for auto-processing graphing," said C. Bret Jessel, a manager at Bausch and Lomb, in Rochester, N.Y.

Stanford Graphics 2.1 analyzes statistical data and graphically represents it, unlike programs such as DeltaGraph that can only graph it, Jessel said. The update also offers rotatable TrueType axis titles, customized graph defaults, and Object Linking and Embedding client and server support.

For Tim Horning, an independent consultant in Omaha, Neb., the context-sensitive

menus were very helpful.

"In the previous version, when you selected a frame, you had to go to the top of the menu bar to see your options," Horning said. "With the new version, if you click on the frame, it gives you a floating menu in the middle of the screen that tells you the options. It is instant and quick."

Other features include intelligent redraw, a feature that allows users to make annotations without having to wait for the full screen to redraw.

It also allows any object or graph to be filled with clip art.

Stanford Graphics 2.1 will ship in March for \$495. Upgrades will cost \$79.95. Users who buy Version 2.0 after January will receive a free upgrade.

3D Visions Corp. is in Torrance, Calif., at (310) 325-1339.

DocuComp integrates with Word

By STEVE POLLI

Advanced Software Inc. recently added a feature to its document comparison utility that seamlessly integrates the software tool into a Word for Windows pull-down menu.

The update of DocuComp II, priced at \$199.95, includes a special install routine for users of Microsoft Corp.'s Word for Windows. Once the comparison utility is installed it is listed as a Word menu function.

"Users don't need to exit Word, run DocuComp and bring Word back up," said Larry Lightman, president of Advanced Software.

Intended for those who work with words, DocuComp II compares an earlier version of a document with a subsequent version and creates a third composite version with changes noted in three ways.

First, the composite document, marked with line numbers, indicates deletions, insertions, replacements, and moves. A comparison summary report lists the two documents' sizes, dates, lengths, and number of each type of change. A revision list shows each change by page and line number.

DocuComp is a valuable documentation tool for pharmaceutical manufacturers, said Will Andrews, senior technical writer at Abbott Laboratories, in Mountain View, Calif.

"DocuComp has strong reporting capabilities," Andrews said. "In our industry it gets pretty tricky as far as contents of our manuals. There are stringent FDA requirements, and a [documentation] mistake could cost someone their life."

Advanced Software is in Sunnyvale, Calif., at (408) 733-0745.

Development tool introductions heat up ObjectWorld in Boston

By KELLEY DAMORE

BOSTON — Despite the subzero weather, the show floor here at ObjectWorld was ablaze last week with new products.

Companies such as Digital Inc., Inference Software Corp., Hewlett-Packard Co., Digital Equipment Corp., and Pure Software Inc. demonstrated object-oriented development tools for the workstation and PC marketplace.

Digital Inc. demonstrated a relational database interface for its Parts Assembly and Reuse Tool Set (PARTS) Workbench product. This interface allows users to create graphical front-end applications for a variety of databases including OS/2 Database Manager, DB/2, SQL/DS, and SQL/400.

The company also plans to support other relational databases, including Sybase and Oracle. The product is available now for \$995 per server.

Digital also showed a PARTS Cobol Wrapper for its PARTS Workbench. Programs can wrap new or existing Cobol code into a part that can be reused in the Workbench product.

Users can also create graphical links into a Cobol program without having to write any code, Digital officials said. The PARTS Cobol Wrapper is available now for \$1,995.

The company also demon-

strated its programming environment that allows a team of Smalltalk/V users to work together.

Called Team/V for Smalltalk/V for OS/2, the program organizes code into modular units called packages that can be shared among developers. The program includes a package browser that lets a user create and organize definitions, view package structure, and browse classes.

The program also features a definition organizer that lets a

officials said. Other platforms will be available by year end. The product is priced at \$6,995 for the Windows, OS/2, and Macintosh platforms and \$3,995 for the Unix platform.

Hewlett-Packard Co. announced HP Distributed Smalltalk, an implementation of the Object Management Group's COBRA specification.

The program is based on the Smalltalk programming language and lets users simultaneously develop object-oriented applications. These objects can

Digital's Team/V for Smalltalk/V organizes code into units that can be shared among developers.

user view and reorganize definitions within a package. The program is currently in beta testing and will ship this quarter for \$1,495.

Inference Corp., maker of expert systems, has entered the client/server market with a development tool called Art-Enterprise. The product includes GUI class libraries, object-oriented programming, and data modeling capabilities. It will be available on Windows, Macintosh, OS/2, Unix, and MVS.

ArtEnterprise is in beta on the Windows platform and will ship in September, company

link to information stored anywhere in the enterprise using HP's OpenODB. Pricing and ship date have not been set.

From Pure Software Inc. comes a run-time detection tool for C and C++ Unix developers that eliminates run-time errors, memory access errors, and memory leaks. The product is priced at \$4,000 per floating network license, according to the company.

Digital Equipment Corp. announced that it will offer its Common Object Request Broker Software on IBM's AIX, HP's HP-UX, Apple's System 7, and its own OpenVMS.

Easel offers client/server Workbench

By ED SCANNELL

To ride the client/server wave, Easel Corp. is offering users a version of its Workbench tools that lets them build client/server applications to access corporate-wide data.

Version 2.0 of Easel Workbench features an integrated set of object-based tools that make it easy to build a more capable set of corporate-wide solutions.

The new program supports several client/server architectures, such as Windows, OS/2, and DOS-based systems.

"We think the product is unique in that it supports a range of client/server architectures from database server, transaction processing, and peer-to-peer projects to distributed presentation applications, including the [PC] renovation application," said Doug Kahn, Easel president and CEO.

Workbench 2.0's integrated set of tools includes a layout editor, an attribute editor, text and vector-drawing editors, a source-level debugger, and an incremental compiler.

The program's improved interface makes it easier to access program components and development tools, a representative said.

The source-level debugger lets developers visually monitor and control the execution of applications within the development environment. Developers can now set break points, step through their code, and examine and change variable values.

Version 2.0 lets developers select tools, objects, and source-code modules from the program's object-based Parts Catalog. This allows them to "snap" together components of a client/server application more quickly.

The program's WYSIWYG

menu editor makes it possible for developers to construct menu and action bars visually.

Another benefit of the new version is that all compiling can now be done in the background, letting developers engage in another task during large compiles or recompiles.

Available now, Easel Workbench 2.0 comes in two versions: a SQL Edition for creating advanced SQL access applications and the Corporate Edition, which includes the SQL Edition plus other client/server options including peer-to-peer communications.

The Easel Workbench SQL Edition for Windows and OS/2 are priced at \$3,995 and \$5,995, respectively.

Easel Workbench Corporate Editions for DOS, Windows, and OS/2 are \$7,900, \$9,900, and \$10,900, respectively.

Easel of Burlington, Mass., can be reached at (617) 221-2100.

YourWay 3.0 improves output, customization capabilities

BY ED SCANNELL

Prisma Software Corp. has upgraded its Windows-based contact management package with a number of features, including drag and drop, a button bar, and more speed.

Version 3.0 of YourWay now lets users create what the company says is typeset-quality address books, as well as mailing labels, cards, and envelopes.

"With this version our goal was to continue making the program as flexible as possible," said Guy Chiatello, president of Prisma Software.

Users can also arrange the look of their calendars, as well as call and task management screens, so that they best suit individual work styles, Chiatello said.

The program's enhanced printing capabilities make it possible to produce customized printouts to any popular daily planner or size, including Daytimers,

Franklin, Fil-O-Fax, and DayRunner.

YourWay 3.0 has more than 100 enhancements, the majority of which the company has stockpiled from user suggestions over the past year.

Among those improvements are the capability to customize a calendar to display 15-, 30-, or 60-minute increments, to customize the program's start-up by choosing the view and default file to

open, and a search feature that helps users find people, appointments, or notes on the calendar.

Users can also transfer items automatically from master lists to daily lists and forward tasks each day.

Version 3.0 also has macros that let users more easily work back and forth with other Windows-based applications, such as Microsoft Corp.'s Word, Word-

Perfect Corp.'s WordPerfect 5.2, and Lotus Development Corp.'s Ami Pro 3.0.

The program has a suggested retail price of \$99. Users of previous versions can upgrade for \$29 by calling (800) 437-2685 or faxing their order to (319) 266-2522.

Prisma Software is located in Cedar Falls, Iowa, and can be reached at (319) 266-7141.

'Sharpened Tools' built for PenPoint operating system

BY YVONNE LEE

Finding a gap in the utilities provided with Go Corp.'s PenPoint, a Seattle company has announced a group of utilities for the operating system.

Sharpened Software Inc.'s Sharpened Tools appear at the bottom of the screen in the "bookshelf," similar to utilities that ship with PenPoint.

The tools include a battery meter and CPU meter for managing power, a document finder, a clock, a calendar, and a "tool box" for grouping applications and documents in a single location.

All the tools work with other PenPoint applications, allowing users to pop dates from the calendar or calculations from the calculator into a fax or spreadsheet, for example.

Sharpened Tools will sell for \$49.95 and will be available this month. The tools will also ship free with Sharpened Software's In Order note organizer, announced late last year and scheduled to ship in March.

In Order tries to combine the free-form flexibility of paper with database labeling and retrieval.

"Everyone has scraps of paper and Post-it notes," said Michael Libes, Sharpened Software's president. "But after a few days, you can't always find your notes."

The product uses a card metaphor, allowing users to take notes on blank, lined, graphed, or numbered pages.

Users can label each card, place free-form text and drawings, and list several categories at the bottom of the card to help retrieve it later.

The program will look up notes by date, card name, or category. It will search at 1,000 cards per second, no matter how much information is on the cards, Libes said.

Users can also select and change the pen thicknesses, gray scale, ink pattern, other pen attributes, and eraser.

Sharpened Software can be reached at (206) 283-0628.

THE GENIUS OF FLEXIBILITY™

“Buy an Office, then start building.”

— Fred Duguay

Microsoft Project for Windows
Provides the power and versatility to successfully manage projects of any size and scope.
\$448

Microsoft TrueType Font Pack
44 TrueType fonts, scalable to any size, improves any document's appearance.
\$48

Microsoft Windows 3.1
Major upgrade increases system speed & reliability. Full Product \$89 Upgrade:
\$49

Microsoft Office 3.0
Includes Microsoft Excel, Microsoft Word for Windows, Microsoft PowerPoint, and a license for a Microsoft Mail client.
\$459

Microsoft Access
Breakthrough new relational database easily incorporates pictures, sound, and video as well as numbers and text. Special Promotional Price:
\$99

Microsoft Schedule+ Starter Kit
This timesaving tool for Microsoft Mail users organizes your time.
\$129

Microsoft DOS 5.0 Upgrade
Offers Windows users significant memory management enhancements.
\$59



Microsoft Office for Windows™ is the ideal foundation for building your business — the most economical way to bring the leading Windows word processing, spreadsheet, and graphics programs to your office. We've assembled several accessories that enhance the Windows desktop and increase productivity. Fred Duguay, our Inside Sales and Service Representative, points out that Corporate Software's special prices make your Office building a great investment, too. To design your office, call Corporate Software today.

(8 0 0) 6 7 7 - 4 0 0 3

CORPORATE
SOFTWARE

UNITED STATES / CANADA / BELGIUM / FRANCE / GERMANY / UNITED KINGDOM

PhotoCard, Visa, Discover and American Express accepted (U.S. orders only). Prices do not include applicable sales tax, handling and freight. Corporate Software Inc., 275 Oak Road, Canton, MA 02021. Prices and promotion available January 1, 1993 through February 28, 1993. Call for Canadian Pricing. All products remain intellectual property assets of their respective companies.

The Added Advantage:
Liveness™. Anyone can sell you software. Corporate Software offers you Liveness people like Fred Duguay, who understand your company, not just your computer systems. Our Liveness can make the difference between owning a lot of software and using it productively. The Liveness side of software is available only from Corporate Software.



Product Spotlight

Expert Draw includes library



Expert Software Inc. plans to ship a low-priced drawing package that promises Macintosh users an easy-to-use program. The \$49.95 Expert Draw includes a library of editable clip art, 24-bit color support, and the option to import or export any Paint, PICT, PICT2, EPS, or QuickTime files. Placement controls let the user bring objects to the front, send to back, align, distribute, and snap to grids. The System 7-savvy product will bind text to a shape or flow it within a shape. Users also can blend colors and patterns from one object to another and create their own gradient fills. Program commands let users move, stretch, scale, rotate, flip, nudge, group, and ungroup objects. Graphic tools include lines, ovals, and straight and smooth polygons. Expert Software is in Coral Gables, Fla., at (800) 759-2562.

SPSS for Windows serves statistics agency's needs

By DOUG BARNEY

Did you know that all the records from the Federal Records Center could fill the Washington Monument more than 11 times?

That is just one of thousands of facts and figures the U.S. General Accounting Office has compiled using SPSS Inc.'s statistical software.

The GAO, which has been using SPSS software for nearly 20 years, has recently switched users to the \$695 SPSS for Windows, said Harry M. Conley, assistant director of sampling methodology in the GAO's program evaluation and methodology division, in Washington.

The GAO's main charter is to provide information requested by Congress to help make proper policy decisions. The organization then conducts surveys, compiles the information, and

provides data analysis with the help of statistical software from the SAS Institute Inc. of Cary, N.C., or from SPSS. The end result is some 900 reports per year, which are made available to the general public.

"[The reports include] every-

quest has been made and approved, the GAO develops a questionnaire and gathers results. Some returns are entered via old keypunch cards into an IBM mainframe, where it is downloaded to servers. Smaller samples are input directly into the PC systems, Conley said.

Conley's personal system is a 33-MHz 386, with 12 megabytes of RAM, a 120-megabyte hard drive, Windows 3.1, and DOS 5.0.

With this machine, Conley can load SPSS, then tap into another program to answer a request for data, and then return to his statistics work.

Additionally, the Windows version includes the log file that records the program's actions and calculations with the output file. This way the log file cannot be overwritten and the trail of assumptions will not be lost.

SPSS, based in Chicago, can be reached at (800) 543-2185.

The GAO has been using SPSS for nearly 20 years.

thing from flood insurance to the financial statement of the U.S. Army. From the way a procurement for computers should work to how well records are stored at the Federal Records Center," Conley explained.

Once a specific research re-

Interleaf tool links documents across platforms, applications

By ED SCANNELL

Interleaf Inc. unveiled a live-link technology that links documents existing across different hardware platforms, operating systems, and applications.

The Active Link Tool allows users to maintain active links to data over networks in mixed

computing environments. For instance, Unix documents can be linked across a network to data residing on an Intel-based desktop system.

The tool's application programming interface is purposely designed to make it easier for third-party developers to build custom programs that fit with

the Interleaf 5 product series.

Active Link also has off-the-shelf support for connections to most graphics formats. Users can establish links to other formats through a direct extension procedure, a representative said.

The company is offering custom integrations with applica-

tions targeted at several vertical markets, such as aerospace, pharmaceuticals, and computer-aided engineering.

Interleaf representatives said Active Link is being shipped as part of Digital Equipment Corp.'s Cohesion ASD/SEE package, which is now going to the military's F-22 tactical flight-

er project.

Compatible with all the popular workstation platforms currently supported by Interleaf, Active Link has a specified price of \$335 when purchased in volume.

Interleaf, in Waltham, Mass., can be reached at (617) 290-0770.



Window Manager / Brian Livingston

PIF files are great for DOS commands or printer sequences

In my January 25 and February 1 columns, I described ways to force Windows to do things it ordinarily cannot do. For example, File Manager cannot print a file of file names or compare two files byte-for-byte. But you can harness DOS commands to perform these two functions by clicking File Run and typing commands like the following:

```
command /c dir >|pt command /c comp file1 file2
```

If you need to use internal commands like Dir, often you can put them into PIF files. Then you can run them without typing the whole command line.

To do this, open the PIF Editor from Program Manager. In the Command Line box, type the word %COMSPEC%. This is an environmental variable (you must include the percent signs) that always contains the location of COMMAN.DOC. In the Optional Parameters box, type /C DIR >|PT1 (or whatever your

command line is). When you save this PIF, click OK to ignore the "invalid extension" message you get.

You can even make a PIF that allows you to specify any DOS command. In the Optional Parameters box, simply type a question mark. In the Window Title box, type type /C and any DOS command.

Save this PIF file as DOS.PIF. Now any time you need to run a single DOS command, click File Run, type DOS, and click OK. A dialog box similar to the one at right appears. You can type any DOS command into this box, and the command runs without your having to open a DOS session first.

If you run commands that require you to read the output on-screen, turn off the Close Window On Exit setting in your PIF file. This makes the session remain visible until you type EXIT to close it.

If you run DOS commands that send output to your printer and you have a laser printer, you may notice that the last

page of output doesn't emerge automatically. You can walk over to your laser printer, take it off-line and press the "form feed" button to eject the final page. But there's an easier way.

Simply create a one-line batch file called FF.BAT. This file should contain the following line: echo ^>|pt1.

This batch file sends a Ctrl-L character, a form feed for most printers, to the

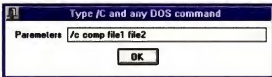
Ctrl-L and the character is inserted.

You may prefer using DOS's Edin utility — for good reason. But Edit can't ordinarily type control characters. You can, however, insert control characters into batch files with Edit by using the following undocumented feature. First press Ctrl-P, then hold down Alt while you type on your numeric keypad the number of the control character. Ctrl-L is Alt-1, Ctrl-I is Alt-2, Escape is Alt-27, and so on. In Edit, Ctrl-L looks like the scientific "female" symbol.

Once you've saved your FF.BAT file, simply click File Run in any Windows shell, type FF and click OK. You should see a DOS session flash on your screen for a second, and any output in your laser printer should emerge.

Of course, you can change FF.BAT to send a form feed to printers on LPT2, COM1, and so on, by specifying that port.

Brian Livingston's new book is *Windows Games (DOS Books)*. Send tips to: ComputerServe 70053, 2035; MC1 420-0553; Internet 420053@mcimail.com; or fax (206) 282-1248.



printer on LPT1.

Sadly, Windows won't allow you to insert these control characters. You can't type a control character in any File Run dialog box, and you can't create a batch file containing such a character using the Windows Notepad, either.

Ironically, it's easy to put a control character in a batch file using DOS's much-maligned Edin. You simply press

You
Could Buy
One Windows
Database For
Your Users
And Another
For Your
Developers.

Or You Could Be Than Microsoft

INTRODUCING SUPERBASE VERSION 2.0.

It's the one and only Windows® database that works for everyone.

Our competition seems to think that you need two databases to do serious applications, one database for developers and another for users. Not so. Software Publishing Corporation has put it all into one clearly superior database that'll get developers and their users working together. Instead of against one another.

That one database is Superbase version 2.0. It offers all the power and sophistication developers demand. The point-and-click simplicity users crave. And for IS managers, the pleasure of supporting one database. Instead of two.

A quick tour of this ad will give you some idea of just how good Superbase version 2.0 really is. And then, if you're as smart as we think you are, you'll want to get your hands on a copy of the real thing. Superbase version 2.0. The one that works for everyone.



A Standard For Everyone. And A Place For Everything.

Beneath its standard easy-to-use Windows interface, you'll find everything from files that can be a billion records deep to advanced multimedia capabilities and direct support for 15 popular image formats. And all this on a high performance database engine that's lightning fast even on 386® machines.

Oracle Server

Oracle Server
Gupta SQLBase
Microsoft SQL Server
Sybase SQL Server
xDB
pubs

It Connects Everyone To Everything.

Wherever your existing data exists, users can get there from here. Superbase version 2.0 directly reads and writes data from dBase® files. Imports and exports Paradox®. Excel® and Lotus® files. There's support for OLE, DDE and DLL. And (developers rejoice) our optional Superbase SQL Library lets you build applications with direct access to SQL databases throughout your organization.



Everyone Loves A Winner. Superbase version 2.0 just won Windows Magazine's 1993 Win Award. Moreover, earlier versions of Superbase have racked up awards for years, including every 1992 Readers' Choice Award worth winning. All this while our Windows competitors are still wet behind the ears.

Call 1-800-336-8360, Op. 501 For A Free IntroPack or \$199 Competitive Upgrade.



e A Lot Smarter Thinks You Are.



Everyone Should Be So Productive, with Superbase version 2.0 both users and developers will be more productive than ever before. With our new graphical Query by Example (QBE) feature, for instance, users can select data by simply pointing and clicking on the QBE icons. And the Quick Report feature is a real time saver for both users and developers, providing point-and-click data summary and page layout controls.



Tools Everyone Can

Use. Real developers will find our procedural, event-driven Super Basic Language familiar and easy to use. And everyone, developers or not, will be right at home with object-oriented visual development tools like our powerful Form Designer. Which lets you create screens, file links and multiple master/detail data relationships. All without time-consuming coding, as our Macro Recorder automatically generates the code.



How To Give Everyone An Icon Of Their Own.

The Superbase version 2.0 Icon Bar is fully and easily customizable. With minimal programming, developers can give every application an interface that makes perfect sense to everyone. Which, in turn, saves users learning time and IS managers support time.



There's Even An Offer That Works For Everyone.

If what you see here looks interesting, now's the time to act. Because for a limited time* we're offering Superbase version 2.0 (SRP \$795) for only \$199 to everyone using any DOS or Windows programmable database. See your software reseller or call the number below. Quick, before everyone else does.

Superbase version 2.0. The One That Works For Everyone.

SPC SOFTWARE PUBLISHING

Introducing Borland's Paradox for Windows

Experience the magic of easy database power

If you're looking for the easiest-to-use, most powerful, and most reliable Windows database, this is it! With new Paradox® for Windows, there's no limit to what you can do.

The graphical interface makes it easy to access, modify, and present your data. Create customer lists in seconds, automatically generate reports with the push of a button, or retrieve data from different sources into a single answer table.

The best way to manage Paradox and dBASE data

Paradox for Windows makes it easy to work with your Paradox and dBASE® data. You can view, edit, query, and link to all your data, with no limitations. You make your request for data simply by checking off boxes with easy-to-use Query By Example. Then the Paradox for Windows query optimizer automatically

determines the fastest way to deliver the answer.

Paradox for Windows lets you manage virtually unlimited data types, too. You can store any kind of information, including text, menus, graphics, OLE objects, sound, and even multimedia. You can even mix and match Paradox and dBASE data in queries, forms, and reports.

More people trust their data to Borland than all other database companies combined. That's why Borland is the Data Company. Put the power of Paradox to work for you today. You will be amazed at what you can do.

Special Offer!

OBJECT COMPUTING NOW!



BEST DATA CONNECTIVITY



Paradox is the best Windows database

	Paradox	Access
Performance		
Insert 1,000 records*	29 sec	147 sec
Range selection: 15,000 of 130,000 records*	<1 sec	16 sec
Complete Paradox and dBASE file support	✓	
Visual data modeling for forms and reports	✓	
Object-oriented development environment	✓	

*All tests run on IBM® PS/2 Model 70 386/20 mhz, 4Mb RAM, Novell 3.11 NetWare, Ethernet network. Special offer good in the United States and Canada only. Prices in U.S. dollars. Copyright © 1993 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. B1 1548

Special Introductory offer.

Offer expires April 30, 1993.

\$139⁹⁵

(regular list price \$795)

See your dealer or call now,

1-800-336-6464, ext. 5192

In Canada, call 1-800-461-3327.



Borland Paradox
for Windows

NEWS / HARDWARE

PIPELINE

ANNOUNCED

Wyse expands EISA line with four models

Wyse Technology Inc. has added four new models to its Decision 486se series. The processors for those systems include 25- and 33-MHz 486SXes and the 486DX/50 and 486DX/66. All of the systems will include an upgrade socket, 4 megabytes of RAM, local bus graphics, and DOS 5.0. Prices for the systems range from \$1,829 to \$2,979. (408) 473-1210.

The Environmental Protection Agency has expanded its Energy Star program to include printer manufacturers. Along with newcomers Lexmark and Dataproducts, the printer divisions of Apple, Hewlett-Packard Co., Compaq Computer Corp., and Bull Italia have joined their systems divisions in promising to deliver energy-efficient products under the EPA's guidelines. (202) 233-9114.

FINANCIALS

Dell predicts record year for fiscal 1992

For its fiscal year 1992, Dell Computer Corp. is projecting that the company's revenues will top \$2 billion. Dell is expecting sales of \$615 million for the fourth quarter, which ended January 31. Earnings for the year are expected to be about \$10 million, although the fourth-quarter results are not completed yet, the company said. (800) 289-3355.

BUNDLES

HP, Sunland offer GUI/memory bundle

Lying awake nights worrying about whether you have enough RAM to meet your requirements? Not getting enough of a look at Windows? Fret no more, as both of those problems can be solved with a bundle composed of Hewlett-Packard Co.'s Dashboard and Sunland Micro Systems memory products. Sunland memory purchasers receive a free coupon for Dashboard, HP's customizable Windows Interface. An added bonus is that Dashboard will alert users when they are running dangerously low on RAM for their applications. (800) 477-5784.

BusLogic will be adding subsidiary Chantal Systems Corp.'s Paragon Disk Array software for NetWare to its EISA, ISA, and Micro Channel-based SCSI disk array controllers. Prices will range from \$1,395 to \$1,795. (408) 492-9090.

IBM announces nine RISC workstations

Hopes to revitalize desktop sales with the RS/6000-based systems

By Ed Scannell

In its broadest set of workstation announcements in three years, IBM strengthened the RS/6000 line with nine systems, including a desktop unit priced at \$3,995.

The PowerStation M20, a diskless two-dimensional color graphics system, incorporates the processor within its display, saving users money and desktop space, a representative said.

The 33-MHz system is a single-chip implementation of IBM's Power Architecture and comes standard with a 17-inch color display, 16 megabytes of main memory expandable to 64 megabytes, integrated SCSI controller, and Ethernet adapter. The system will be available in March.

IBM also announced a higher end follow-up to its Xstation 130. The Xstation 150 has 6

megabytes of memory, a 16-inch color display, one parallel and four serial ports, and a Windows-based version of X Windows preloaded.

Targeted at competitive offerings from Hewlett-Packard Co. and Digital Equipment Corp., the Xstation 150 is priced at \$5,539 and is scheduled to be available by the end of March.

Big Blue also rolled out three workstations aimed primarily at the technical markets: PowerStations 355, 365, and 375.

The new packaging now lets users choose from three IBM 6091 displays, one of several graphics adapters, and a one-to-two user license for AIX/6000 and AIX Windows Environment/60002D.

The 42-MHz 355 and 50-MHz 365 have 16 megabytes of main memory, the 62-MHz 375 has 32 megabytes. Other standard features include a 32K cache and 400-megabyte hard drive expandable to 2 gigabytes.

The new technical workstations are the first to use IBM's 80-megabyte-per-second implementation of the Micro Channel bus. SCSI and Ethernet adapters are integrated on the motherboard.

The PowerStation 355 costs \$15,995, and the 365 goes for \$19,525. The 375 is priced at \$25,225. All three will be available by the end of this month.



IBM expanded its RS/6000 series of workstations to include the PowerStation 355.

By YVONNE LEE

Micro Electronics Inc. has introduced a low-priced notebook that resembles the PowerBook but runs Microsoft Windows.

The 486SLC/E-based WinBook has a two-button trackball below the keyboard, similar to the design of Apple Computer Inc.'s PowerBook.

The WinBook's keyboard and trackball were designed by Palo

Alto Design, which created the Next computers. The WinBook has a sloping keyboard and beveled edges.

It comes with a 180-megabyte hard drive, a floppy drive, a PCMCIA type II slot, 4 megabytes of RAM upgradeable to 8 megabytes, and a 2,400/9,600-bit-per-second fax/modem built in.

The WinBook uses nickel-metal-hydride batteries that run



Active matrix, TFT screens are poised to become the display of choice as prices are expected to drop dramatically this year.

Price of flat-panel color coming down

Race to market technologies is on

By DAVID KELLAR

TOKYO — Computer users will start to see larger, crisper, and less-expensive flat-panel displays this year as a result of a technology race in Japan that's nearing the finish line.

Canon Inc. will hit the tape first this month with the release in Japan of a new 15-inch monochrome ferroelectric liquid crystal display (FLCD) as part of its desktop publishing system.

Fujitsu Ltd. will introduce in April a color plasma display panel (PDP), and Sharp Corp. plans to release in June the world's first 17-inch color thin-film transistor (TFT) LCD for engineering workstations.

In addition, Matsushita Electric Industrial Co. and NEC Corp. are leading the charge to provide high-quality "flat CRTs" for computer-aided design applications and low-cost color TFT LCDs for more affordable color notebook PCs.

Japanese flat-panel display technology is advancing at a screaming pace, according to Steve Myers, senior industrial electronics analyst at Jardine Fleming Securities Ltd., in Tokyo.

"Computer users will soon benefit from a much broader

range of [display] choices," Myers said.

For active matrix LCD manufacturing facilities alone, Japanese firms have invested more than \$2 billion in the past three years, according to a 1992 report by the U.S. government-funded Japan Technology Evaluation Center, based in Baltimore.

The main area of contention lies in guessing which flat-panel technology — if any — will be able to provide sufficiently high picture quality and low enough cost to replace the 20- to 30-inch color CRTs currently used for graphics and computer-aided design applications.

TFT LCD GETS ATTENTION. Of the various flat-panel display technologies, color TFT LCD development is the main focus of most major computer companies in Japan.

The reason is that TFT LCD technology is viewed as the best technology for portable computer displays and for thin desktop engineering workstation displays as large as 20 inches.

The demand for high-quality color is the biggest factor in making TFT LCDs the technology of choice for thin computer displays, says Hidekichi Katoh, See FLAT-PANEL, page 25

Entry-level PowerBook-style notebook runs Windows

A \$399 docking station with two expansion slots will be introduced later this year, the company said.

WinBook will be available in mid-March through Micro Electronics' direct sales force and through the company's Micro Center stores. It will cost \$1,699.

Micro Electronics of Columbus, Ohio, can be reached at (800) 468-2162.



Unisys has upgraded its Intel-based line of Unix servers to the 486DX2/66 microprocessor with a line that starts at \$10,000.

Unisys ships servers based on clock-doubling 486DX2

By CATE CORCORAN

Unisys Corp. is now shipping three Intel-based Unix servers that can be used as workgroup or departmental LAN servers or server nodes in enterprise-wide On-Line Transaction Processing (OLTP) networks.

The U 6000/35 models are based on Intel's 66-MHz 486DX2 microprocessor, which runs at 66 MHz internally and 33 MHz externally.

Previously, the U 6000/35 product line was based on Intel's 33-MHz chip.

The systems come with 16 megabytes of RAM, expandable to 64 megabytes. Also included are a 150-megabyte quarter-inch cartridge tape drive and a 5-1/4-inch disk drive. The systems have six empty EISA slots.

The diskless Model F66 lists for \$10,100. Adding a 240-

megabyte disk costs \$2,095; a 425-megabyte disk is priced at \$2,595; and a 1.35-gigabyte disk is available with the system for \$8,500.

The U 6000/35 Model D66 lists for \$11,700 and comes equipped with a 240-megabyte hard disk.

Model E66, which lists for \$12,200, comes with a 425-megabyte hard disk.

An optional Unisys Mass-Cab-2 mass storage subsystem is available for \$12,500.

It adds mainframe-class I/O performance and increases storage capacity, availability, and redundancy, the company said. It can be expanded to more than 44 gigabytes.

Upgrade options for current 33-MHz U 6000/35 customers will be available this quarter.

Unisys is located in Blue Bell, Pa., and can be reached at (215) 986-4011.

RasterOps, Radius are fading

Mac display firms losing ground to Apple, SuperMac

By SHAWN WILLET

The Macintosh graphics and display market continues to be a tough one for RasterOps Corp. and Radius Inc., which are losing market share to Apple Computer Inc. and SuperMac Technology.

RasterOps and Radius, once stars of Wall Street, said they are diversifying into new product areas to regain profitability.

Vendors and observers say Apple's entry into the 24-bit display market with its Quadra line is hurting the companies, as is constant price cutting.

"Apple has capped the market for display, the place where Radius made its fortune," said Jon Peddie, an analyst at Jon

Peddie Associates, in Oakland, Calif.

To combat Apple, both companies have been offering discounts and competitive upgrades on their 8- and 24-bit boards and displays, which have cut into profits.

Last quarter RasterOps reported a revenue drop of 7 percent to \$26.8 million from the same quarter a year earlier, while it lost \$1.5 million.

Radius reported a flat quarter with revenues of \$36.9 million and a loss of more than \$2 million. Both companies reported poor financial results for two consecutive quarters.

"Some of this is related to supply constraints and the recession," said Ed Colligan,

director of product management at Radius, in San Jose, Calif.

Radius officials said Apple's sales also dropped off this past summer, which resulted in lower sales for display makers.

Another factor is SuperMac Technology's continued strong growth. Its sales increased 81 percent to \$39.4 million in the quarter ending December, and income rose 87 percent from a year earlier.

To survive, Radius said it is expanding the company's focus with more system software such as RocketShare. RasterOps is also diversifying, targeting niche markets such as prepress publishing with a new dye sublimation printer.

Logitech readies 16-bit sound card

By CATE CORCORAN

Logitech Inc. will ship this month its first sound board, a 16-bit sound card with a list price of \$289.

The SoundMan board can record and play back CD-quality, 16-bit, sound at rates as high as 44 kHz. It also has 20-voice MIDI support and FM stereo synthesis.

The board is based on the 16-bit Spectrum chip set from Media Vision Inc. It also has a Yamaha OPL-3 chip for FM synthesis. SoundMan is compatible with the SoundBlaster 1.5 and AdLib boards.

The board is easy to install

because its settings can be selected in software rather than with jumper cables, according to Logitech. In addition, the installation program is easy to

Settings can be selected in software.

use because the board prompts the user with specific settings, Logitech said.

SoundMan features stereo audio in and out jacks, a 4-watt-

per-channel amplifier, and on-board stereo-in connectors for an internal CD player. Its software mixer allows the user to combine, insert, or blend sound files. The mixer will also add echo or reverb and slow down or speed up a sound file.

Logitech, which is well known for its mice but also makes scanners and a head tracker, plans to introduce other multimedia products.

Logitech and Media Vision are working together on developing a better user interface for sound cards, said Paul Jain, Media Vision president.

Logitech, in Fremont, Calif., is at (510) 795-8500.

ALR 486 line features VESA local bus

Evolution IV series includes multimedia systems

By TOM QUINNAN

Advanced Logic Research Inc. has introduced a midrange series of computers that feature 486 processors and VESA-compatible local bus graphics.

The Evolution IV comes in eight models: four equipped with an ISA bus and four with a 32-bit EISA bus.

The processors currently include the 25- and 33-MHz 486SX, the 33-MHz 486DX, and the 50- and 66-MHz 486DX2 chips. All of the systems come with 4 megabytes of RAM and either a 170- or a 240-megabyte hard drive.

Users will also have their choice of local bus graphics adapters, including an adapter with local bus graphics and a

256K cache.

ALR will also offer Kodak's Access Software and Photo CD compatibility with multimedia systems based on a 25-MHz 486SX and a 33-MHz 486DX.

The Evolution IV MPC systems will be configured similarly to the standard Evolution models and will include a CD-ROM drive from Sony Corp. of America and a Pro Audio Spectrum 16 sound card. Color 14-inch and 17-inch monitors are optional.

All of the systems are sched-



ALR is offering users an upgradable, mid-range line that features local bus graphics.

uled to ship in March.

Standard systems will range in price from \$1,929 to \$3,229. The Evolution MPC models will cost from \$2,778 to \$4,078.

ALR, in Irvine, Calif., can be reached at (800) 444-4257.

Zeos Contenda subnotebook boasts 386SL chip, VGA monitor

By YVONNE LEE

Zeos International Ltd. last week began shipping the Contenda, a 386SL-based subnotebook with a VGA screen.

Unlike previous subnotebooks, such as Sharp Electronics Corp.'s PC-3000 and the Gateway Handbook, that use lower end, 8086-compatible microprocessors, the Contenda uses a 25-MHz 386SL.

The 9.7-by-6.1-inch computer also has a 7.4-inch backlit VGA screen instead of the CGA screen used on similar-size computers.

The screen displays 64 shades of gray. The Contenda also has a VGA port to display simultaneously on its own screen and a standard VGA monitor.

Pricing for the Contenda is

\$1,495. A \$1,795 bundled model with 4 megabytes of RAM, a floppy drive, DOS, Windows, and a Lotus Organizer is scheduled to ship in two weeks. A \$1,995 model will contain the bundled options plus a nylon case and the internal modem.

The Contenda's 2 megabytes of RAM can be expanded to 10 megabytes. The system's 80-key keyboard has an embedded numeric keypad, and the computer also sports a built-in trackball. Options include an external floppy drive and internal fax modem.

The company estimates the Contenda's battery life at 4 hours with power management.

Zeos International, headquartered in St. Paul, Minn., can be reached at (800) 423-5891.

FLAT-PANEL / from page 23

Price of flat-panel color coming down

chief manager of technology in NEC's color LCD division.

"Color plasma displays, electroluminescent [EL] displays, and super-twist nematic [STN] LCDs have too many trade-offs in terms of contrast, response speed, and resolution," Katoh said.

DESKTOP CONCERNS. On the desktop, the massive space requirements of CRTs make thin-panel displays very attractive. However, CRTs still — and probably always will — offer better color, contrast, brightness, and resolution than any flat-panel display.

"Plasma, STN, and EL are children compared to the quality obtainable with CRT technology. TFT is still a teenager but is quickly growing into an adult," said Katoh, who views TFT as coming closest to CRT quality while still providing the thin, lightweight, low-power benefits of a flat-panel display.

As such, NEC expects to increase monthly production of the 9.4-inch screens to 70,000 units by next year. The jump in volume could drive prices as low as \$400 per display by 1995, Katoh said. Color TFT LCDs currently cost approximately \$1,600 to \$2,000.

Fujitsu is also getting into the act, recently announcing its own line of color TFTs that are now mass-producing in 1994 for internal use and outside sales.

"This is a market we cannot afford to miss," said Hikotaro Masunaga, managing director of Fujitsu's LCD research and development group.



Canon is attempting to establish its PLCD technology as an alternative to TFT.

Hitachi, like NEC, is placing most of its eggs in the TFT LCD basket because the devices can be used in applications such as notebook computers where CRTs are not practical, said Zenzo Tajima, product manager of Hitachi's electron tube and devices division.

SHARP AIMS HIGH. Sharp, confident in its dominant position in the notebook LCD world, has set its sights on loftier — and costlier — goals, such as the high-dollar CAD market.

In December the firm started shipping samples of 17-inch 1,280-by-1,024-pixel and 10.4-inch 1,024-by-768-pixel color TFT LCDs.

The 10.4-inch model is aimed at power laptop users who need XGA compatibility, and the 17-inch model is targeted at high-performance "luggable" workstations. Both models will be commercially available in June, a Sharp official said.

Ricoh introduces magneto-optical storage drives for PCs with SCSI

By KELLEY DAMORE

Primarily known as an OEM supplier, Ricoh Corp. has entered the end-user arena with four optical storage drives.

Ricoh's HyperSpace 3½-inch magneto-optical (MO) drive and Transporter 3½-inch MO drive will include a drive unit, Corel SCSI driver software, a SCSI host adapter, a SCSI cable, and power supply.

Coupled with the end-user product debut, Ricoh announced a strategic alliance with Corel Systems Corp., maker of optical drive software. Under this agreement, Ricoh will bundle Corel's SCSI driver software.

This ensures that optical storage devices from Sony Corp. of America, IBM, and Ricoh will

be compatible with Corel driver software and SCSI host adapters.

Currently, optical disc drives for PCs are not as interchangeable as in other environments, such as Macintosh or Sun. One of the reasons is that a PC does not typically have a built-in SCSI interface, and PC-based SCSI host adapters are not necessarily compatible with one another.

Ricoh hopes that this alliance will spawn a standard for optical drives.

"You can put a floppy into another machine," said Toshi Izuka, product manager for the Ricoh File Products Division. "This is not yet the case for the optical market."

The 650-megabyte 5½-inch HyperSpace PC offers a 3,600-

rpm rotational speed, a 1-megabyte transfer rate, a 28-millisecond seek time, and a 37-millisecond access time.

The EISA-based HyperSpace PC/e is priced at \$4,195, and the ISA-based HyperSpace PC/i is \$4,095.

The Transporter PC, a 3½-inch rewritable drive, features a 3,000-rpm rotational speed, a 640K transfer rate, a 35-millisecond seek time, and a 45-millisecond access time.

The Transporter PC/e is \$2,195, and the Transporter PC/i retails for \$1,995.

Both systems come in internal and external versions. The products will be available this month through dealers.

Ricoh, located in San Jose, Calif., can be reached at (800) 955-3453.

Exabyte buys Talgrass, Everex mass storage

By SHAWN WILLET

Tape vendor Exabyte Inc. said its plans to expand into the retail PC and LAN markets with its acquisition of Talgrass Technologies Corp. and Everex Systems Inc.'s mass storage division.

"To continue growing as a company, we have to go into different marketplaces," said Martin McCoy, Exabyte's vice president of strategic planning and programs.

Talgrass — which integrates and distributes quarter-inch cartridge (QIC), 4mm, and 8mm tape drives for Novell Inc. servers — will bring the company's retail distribution channels and a customer base of PC LAN users, McCoy said.

Exabyte purchased Talgrass for \$1.5 million in cash.

The company also purchased for \$5.5 million Everex's mass storage division, which makes a variety of QIC and DC-2000 cartridge tape drives. Exabyte is

mainly interested in the technology behind the company's 566-megabyte drive, McCoy said.

Exabyte will acquire the patents and engineering staff from the bankrupt PC maker but not Everex's distribution channels or other contracts, according to Exabyte officials.

Exabyte, which made its mark with multigigabyte 8mm drives, first moved into the PC arena with the purchase in October of R-Byte Inc., a 4mm DAT manufacturer.

Tech Talk / Steve Gibson

Stac deserves its patents, but the future doesn't look good

The first words out of Gary Clow's mouth were, "I read you all the time in *InfoWorld*, Steve, and I know how you feel about intellectual property rights." I had called Stac Electronics' president to discuss the company's recent patent infringement lawsuit against Microsoft. I hoped to get Clow's viewpoint on the history of what had transpired between Stac and Microsoft.

Stac's claim to fame is Stackcr, a "partition compression" DOS add-on utility program that in my experience typically increases the storage capacity of DOS drives by 1.7 times.

According to Stac's legal documents, Bill Gates told Gary Clow during the 1991 fall Comdex that Microsoft was interested in incorporating partition compression into a future version of Microsoft's DOS. This initiated an awkward and frequently contentious dialog between the two companies. It was anything but smooth, Clow says now.

It's impossible to turn the clock back to capture any clear sense of what "really"

happened. However, I get the sense that each side was positioning, posturing, and threatening the other. Stac was willing to provide the code and a license, but Microsoft was not willing to pay a royalty for a piece of MS-DOS. Microsoft offered other compensation, but none of those seemed appropriate to Stac.

Looming in the background of the talks was the question of what would happen if Stac Electronics, a company grown to 200 people who are largely being supported by the sales of the Stackcr partition compressor. Wouldn't Microsoft's inclusion of partition compression in DOS dry up Stacker sales overnight? Given that negotiation climate, it's hardly surprising that a lawsuit was the result.

Stac filed its suit shortly after its engineers took a close look at the DoubleSpace compression appearing in an MS-DOS 6.0 beta, which Microsoft had sent to them. The Stac engineers believed that the technology in the pre-release version of MS-DOS infringed two of Stac's patents covering data compression means and technologies.

Given its sometimes rocky negotiations with Stac, it is clear that Microsoft knew

about the company's patents. So it's hard to understand why Microsoft would have knowingly wandered into this lawsuit as a deliberate infringer. Maybe it didn't think that Stac would follow through with the promise of patent enforcement, or maybe it presumed the two companies would reach an agreement, or maybe Microsoft doesn't believe that the Stac patents are viable, or maybe it doesn't believe that it is infringing them.

One or more of the above is probably true. Unfortunately, we are left to guess about that for now. Due to orders from their attorneys, both sides are unable to answer many specific questions.

Much as I empathize with the entrepreneurial spirit of innovation embodied by Stac's Clow, I don't think things look too bright for Stac. It's not that the company didn't invent something worthy of patenting. In fact, having read and digested the patents, I think the company rightfully owns some very nice technology. It's just that Clow built a 200-person company upon what will turn out to have been a momentary market opportunity.

Is this just sour grapes from one utility maker to another? No. Let me remind

you that I abandoned a three-year development effort when it became apparent that certain functions, like caching, would become part of the core operating system. But, frankly, I think that what Stac has done is just not that big a deal.

Partition compression is probably a good and reasonable thing for many people. It certainly seems to me that Microsoft has the right and the obligation to respond to market pressures from IBM and Novell. Moving compression into DOS is a logical step. There are a great many ways to achieve on-the-fly compression without infringing upon Stac's or anyone else's patents. Microsoft certainly has the resources to develop such technology if it should need to.

Clow was indignant at the notion that Microsoft might be telling him that he needs to find something else to do. Even so, I hope he was listening.

Steve Gibson is the developer and publisher of *SpinRite* and president of *Gibson Research Corp.*, based in Irvine, Calif. Send comments to *InfoWorld* at MCI Mail 259-4127 or fax them to (415) 358-1269.

LOOKS LIKE A WIN WIN WIN WIN SITUATION.

Dell has a complete line of award-winning notebooks.
Which means at prices like these, you can't lose.

DELL™

800-627-9966

WHEN CALLING, PLEASE REFERENCE #11059.

HOURS: 7AM-9PM CT MON-FRI, 8AM-6PM CT SAT, 10AM-3PM CT SUN.
IN CANADA, CALL 800-668-3021. IN MEXICO CITY, 228-7811.



*Quotations available in USA only for registered owners of Dell Performance[™] factory service only for N120 and N125 notebooks. *Listing arranged by Listing registered trademarks and Windows is a trademark of Microsoft Corporation.

THE DELL® 325NC
i386® SL 25 MHz COLOR
NOTEBOOK

\$2,649

- LEASE: \$98/MO.
- 4 MB RAM
- 80 MB (19 m) HARD DRIVE
- VGA COLOR LCD (9", 640 x 480)
- 7.1 LBS. (INCLUDING BATTERY)
- 8.5" x 11" x 2.3"
- NIHM BATTERY
- 3-HOUR BATTERY LIFE
- UP TO 3 HOURS WITH POWER MANAGEMENT ENABLED
- MSDOS® 5.0



260,000 colors.

At your disposal is every color of the palette, and then some. If Van Gogh had one of these, maybe he wouldn't have been so uptight...



Long battery life.

The good news is the battery can hold out flying all the way from L.A. to N.Y. The bad news is, who wants to work all the way from L.A. to N.Y.?



Greater upgradeability.

Along with the special Intel chip made specifically for notebooks, there's also room for a modem, coprocessor, 200 MB hard drive and up to 12 MB of RAM.

THE DELL 325NS
i386 SL 25 MHz
NOTEBOOK

\$2,149

- LEASE: \$80/MO.
- 4 MB RAM
- 80 MB (19 m) HARD DRIVE
- EDGEVIEW VGA LCD (9.5", 640 x 480)
- 6.4 LBS. (INCLUDING BATTERY)
- 8.5" x 11" x 2.1"
- NIHM BATTERY
- 3-HOUR BATTERY LIFE
- UP TO 3 HOURS WITH POWER MANAGEMENT ENABLED
- MSDOS 5.0



Guaranteed Response.

We guarantee that when you call us, you'll talk to a technical specialist within five minutes or less. And that in the unlikely event you have compatibility problems, we'll help you solve them.



Large storage capacity.
200 MB drive available. With all its storage, this little notebook makes the Astrodome seem positively cramped.



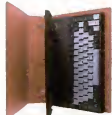
Two-thirds of the FORTUNE 500® are Dell customers.

By the way, those FORTUNE 500 customers are the ones who vote us number one in customer satisfaction surveys.

THE DELL 320SLi
i386 SL 20 MHz 3.6 LB.
NOTEBOOK

\$1,999

- LEASE: \$74/MO.
- 2 MB RAM
- 60 MB (19 m) HARD DRIVE
- REFLECTIVE VGA LCD (9.5", 640 x 480)
- 3.6 LBS. (INCLUDING BATTERY)
- 7.75" x 11" x 1.25"
- NIHM BATTERY
- 3-HOUR BATTERY LIFE
- UP TO 4 HOURS WITH POWER MANAGEMENT ENABLED
- MSDOS 5.0
- MICROSOFT® WINDOWS® 3.1
- LOTUS® ORGANIZER



Only 1.25" thick.

We call it a notebook, but it's actually smaller. Punch a few holes in it and you could carry it in a 3-ring binder.



Stay in touch.

It has an industry-standard PCMCIA type 2 expansion slot for modems and network cards. It's like raking your office with you. Only without the vegetables and office machines.



3.6 pounds.

At a mere 3.6 pounds, it offers features and functions usually reserved for systems twice its weight.

THE DELL DIMENSION® N125'
i386 SL 25 MHz
NOTEBOOK

\$1,699

- LEASE: \$63/MO.
- 2 MB RAM
- 80 MB (19 m) HARD DRIVE
- EDGEVIEW VGA LCD (9.5", 640 x 480)
- 4.3 LBS. (INCLUDING BATTERY)
- 8.3" x 11" x 1.8"
- NICAD BATTERY
- 2.5-HOUR BATTERY LIFE
- UP TO 3.5 HOURS WITH POWER MANAGEMENT ENABLED
- MSDOS 5.0



9.5" screen.

Ever want to see your work up on the big screen? All it takes is a small-screen budget.



Full keyboard.

Your hands don't get smaller just because your computer does. So Dell gave it a full-size, full-travel, 85-key keyboard, including special screen navigation keys in the familiar inverted-T layout.

ALSO AVAILABLE:
THE DELL DIMENSION N120'
i386 SL 20 MHz
NOTEBOOK

\$1,399

- LEASE: \$52/MO.
- 2 MB RAM
- 60 MB (19 m) HARD DRIVE
- EDGEVIEW VGA LCD (8.5", 640 x 480)
- 6.3 LBS. (INCLUDING BATTERY)
- 8.3" x 11" x 1.8"
- NICAD BATTERY
- 2.5-HOUR BATTERY LIFE, UP TO 3.5 HOURS WITH POWER MANAGEMENT ENABLED
- MSDOS 5.0

Performance *Plus* Protection

Spanned For Performance

Mirrored For Protection



Fast SCSI-2 BusMastering Host Adapters



Fault-Tolerant File Servers, Fast as 5.5 ms

Today's network managers are faced with more mission-critical data residing on individual servers. MicroNet provides cost-effective storage solutions offering the ultimate in performance *plus* protection.

MicroNet has engineered its hard disk drive systems to optimize features built into NetWare. By spanning multiple drives, and utilizing multiple host adapters, access times drop as low as 5.5 ms and sustained data transfers climb to an astonishing 12 MB/sec.

But there is another side to the story. All this data needs protection. If a server goes down, recovery is needed as rapidly as possible. By mirroring the hard drive system, a duplicate of the data is on-line should anything go wrong with the primary drive system.

If a fault occurs with the CPU, the complete drive chain can be moved to an ISA, EISA, or MicroChannel workstation utilizing a MicroNet host adapter to create an instant file server!

MicroNet systems offer full protection all the way to the controller card level. Our NetWare device drivers allow a disk drive to be changed on-the-fly. We offer all these features without being locked into a proprietary software or hardware system.

Protection while minimizing down-time is one side of the story. Productivity is the other. By utilizing a MicroNet high performance storage solution, you get performance *plus* protection. Call MicroNet today for more information. 1-714-581-1540.

MicroNet Versus a Typical RAID 5 Disk Array

1994
MicroNet Spanned Disk System - Transactions/Second
398
Typical RAID 5 Disk Array - Transactions/Second

Performance *Plus* Protection, Without Compromise.



MicroNet Technology, Inc.

20 MASON • IRVINE, CA 92718 • TEL: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: MICRONET.SLS • Compuserve: 76004,1611

All trademarks are property of their respective owners.

NEWS / NETWORKING

Software comes to aid of help desks

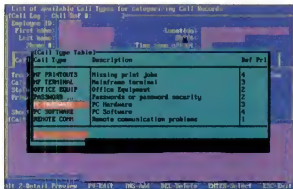
By TORSTEN BUSSE

ORLANDO, Fla. — The folks who help users recover from system failures will get some help of their own this spring, as help desk vendors are supporting Windows and adding more expert system options.

Almost 2,000 help desk professionals gathered here at the International Help Desk Conference to network, train, and try new technologies.

"Many help desks suffer from a high turnover rate," said Fred Schreengost, director of the Help Desk Institute, in Colorado Springs, Colo. "Windows-based tools make training of new personnel easier."

Vycor Corp. showed a Windows version of its help desk and asset management software, DP Umbrella, developed for Microsoft's SQL Server and Sybase. DP Umbrella offers call logging, problem resolution tracking, resource and workgroup allocation, and task breakdown by activity. Shipping



Bendata's stand-alone HEAT help desk tool troubleshoots problems and suggests solutions.

now, DP Umbrella is priced at \$6,995 for a five-user license.

Utopia Information Systems Inc. debuted a faster version of its Utopia system for Windows and SQL Server.

"We can take advantage of SQL Server features such as data integrity and its ad hoc query and report writing capabilities," said Steven Ham-

mersly, president of the San Francisco-based company.

Utopia offers an \$19,900 inventory management module and an \$11,900 help desk call tracking and routing module.

Although Bendata Management Systems Inc. has not ported its Help Desk Expert Automation Tool (HEAT) to Windows, it debuted First Level

Support (FLS), a stand-alone expert system that takes help desk operators through preset solutions to common problems, said Jim Parker, vice president.

FLS' two modules will cost \$1,550 and will be offered with starter kits for Microsoft's Word, Windows, and Excel; Lotus' 1-2-3; and WordPerfect.

Tighter links between PCs and telephones may also speed help desk response. ProActive Software said over the next few months it will link its PC-based Customer Information Resource (CIR) system with Aspect Telecommunications' Aspect CallCenter. The help desk staff member enters an account number, which automatically brings up the history and status of the call.

Utopia can be reached at (800) 786-4778. Call Bendata, in Colorado Springs, Colo., at (719) 531-5007. Vycor, in College Park, Md., can be reached at (800) 888-9267. ProActive can be reached in Mountain View, Calif., at (415) 691-1500.

PRELIMINARY

SHIPPING

Procom NuBus card includes mirroring

The new SCSI-2 NuBus coprocessor card from Procom Technology Inc. includes disk mirroring and striping functions. The \$995 NU32 SECI Enabler transfers data at a rate of 10 megabytes per second between the disk subsystem and the Macintosh. (714) 852-1000.

The National Computer Security Association (NCSA) has released "The Information Security Washbook," a collection of information security resource materials including books, periodicals, research reports, and training materials. To obtain a free copy, call (717) 258-1816.

UPGRADES

LanSafe II line gets Windows interface

Network Security Systems Inc. has added a Windows interface to its LanSafe II network power management line. The enhancement allows network managers to monitor, manage, and configure as many as 1,024 NSSI security protection devices on key network nodes including bridges; workstations; and data, file, and communications servers. LanSafe II also provides access from any workstation on the network, including those at remote sites. It is available now for \$249, with upgrades priced at \$165. (800) 755-7078.

ANNOUNCED

NCD X terminals will run on Token Ring

Network Computing Devices Inc. has announced a product that lets its X terminals run on Token Ring LANs. NCD's Token Ring/PC/MCA (TRP) board, which will support 4- and 16-megabit-per-second Token Ring speeds, will work with both DB-9 shielded and RJ-45 unshielded twisted-pair networks. The TRP board will ship in April for \$595. (415) 694-0650.

Campbell Services Inc. is working with **Fourth Wave Technologies Inc.** to incorporate wireless technology in Campbell's OnTime calendar and scheduling software. The companies are using Fourth Wave's WinPage pager communication software to enable OnTime's Windows version to interact with pagers. Campbell will also support AT&T's PassageWay product that lets users link PC applications to AT&T communications systems. (313) 559-5955.

Server design tailored to SFT III

Tricord systems target NetWare critical data

By JAYNE WILSON

For large network users in need of better data integrity features, Tricord Systems Inc. is bringing out a pair of enterprise servers for NetWare environments running Novell Inc.'s System Fault Tolerance III (SFT III).

The Tricord Model SFT30/33C and the Model SFT30/66C — based on Intel Corp.'s 486 33-MHz and 66-MHz CPUs, respectively — will ship as a mirrored pair of integrated PowerFrame supervisors.

Novell's SFT III software enables users to have two servers tied together by a high-speed

link so that if one fails, the second server takes over and the network doesn't go down.

"The products provide built-in fault tolerance, redundancy, and high-speed links needed for mission-critical applications such as financials and reservations," said Mark Garber, vice president of corporate strategy.

The servers are connected with a high-speed EISA fiber-optic link capable of connecting mirrored servers located up to 1,600 feet apart. The link provides two 100-megabit-per-second channels with a burst mode of 33 megabytes per second. The link also provides error de-

tection and retransmission hardware to ensure the delivery of valid data between the two servers, Garber added.

The new models include the server hardware, the high-speed link, and bus cards for adding the link. The SFT III software, which provides synchronization between the mirrored servers, must be purchased from Novell or a reseller.

The SFT30/33C is priced at



Tricord's SFT30/33C and SFT30/66C server pairs are linked by two channels.

\$55,795, and the SFT30/66C is priced at \$59,795. They are available now.

Tricord, in Minneapolis, can be reached at (612) 557-9005.

OSiWare backbone helps to clear up DOS message bottleneck

By CHERYL GERBER

A small Canadian company introduced last week a set of gateway and electronic mail backbone products that could ease messaging bottlenecks.

OSiWare Inc. announced at ComNet in Washington Unix-based X.400 gateways for Microsoft Mail and Lotus Development's ccMail, as well as an X.400 backbone over TCP/IP for DOS systems.

"This product will remove the bottleneck caused by single-tasking DOS systems that cannot handle the volume of Fortune 500 messages," said Jamie Chang, OSiWare product manager.

"As messaging grows mission critical, customers are looking for multi-tasking Unix systems that solve their throughput and reliability problems," Chang said.

The company also introduced Messenger 4.0 for DOS, an X.400 backbone for DOS users who run TCP/IP. The product supports FTP Software's PC/TCP product.

Analysts saw benefits in a backbone solution. "Instead of using a gateway, the backbone does the switching, ties everyone into a common bus, and reduces the cost of multiple gateways," said

Sara Radicati, president of technology development services at Creative Networks Inc.

OSiWare will ship its ccMail gateway by February 15 and the Microsoft Mail gateway by March 15, priced starting at \$6,500. Messenger 4.0 for DOS with a TCP/IP support option will ship next week for \$1,000 for a stand-alone copy.

OSiWare, in Burnaby, British Columbia, Canada, can be reached at (604) 436-2922.

COMNET

Message system provides a host-to-server gateway link

By Cheryl Gember

Capella Systems Inc. is preparing to ship a message management system that lets users exchange messages between IBM host and LAN-based servers without a gateway.

The back end of SmartScreen Message Manager (SMM) is a gateway to access multiple client systems from the same Windows-interfaced directory. The second quarter SMM will be available for IBM's Profs mainframe messaging and office automation system, and its OfficeVision/VM, Versions 1.1 and 1.2.

Capella is currently shipping the LAN portion with servers

that support Microsoft Corp.'s Message Application Programming Interface (MAPI), said Bill Hiller, Capella vice president of product development.

A beta user said Capella's SMM is an improvement over its predecessor — called simply SmartScreen — because of the addition of MAPI, a cleaner user interface, and desktop access to gateway functions.

"The product went from being just a Profs front end to a messaging management application," said John Trustman, senior vice president of retail marketing systems at Fidelity Investments, in Boston. Trustman said scheduling should be added to a future version and said he still has not received full documentation on the product.

"Prior to this product, we were focused on host systems," said James Ottinger, Capella president. "Now we are going down to LANs and workgroups to help companies rightsize."

Capella will add support for Vendor Independent Messaging in the second quarter and Message Handling Service and public mail later this year.

SmartScreen Message Manager will be priced at \$495 per node; volume pricing and site licenses are available.

Capella, in Atlanta, can be reached at (404) 552-9912.



Capella's SmartScreen Message Manager links LANs and workgroups to IBM hosts.

Bridge links LANs to FDDI

Fiberbus's Ethernet bridge has 60,000-pps speed

By Jayne Wilson

Fiberbus Corp. is rolling out a modular, multiport bridge that incorporates RISC processors for high-performance bridging and routing between Ethernet LANs or to FDDI backbones.

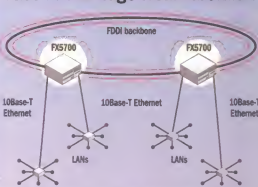
The FX5700, targeted to large installations that need to connect backbones to data centers, will provide a forwarding performance rate of nearly 60,000 packets per second (pps), company officials said.

"This product can be used as an Ethernet-to-FDDI and as a multiport Ethernet bridge," said Steve Storozum, Fiberbus senior product manager. "Its multiple RISC architecture [featuring a RISC processor on each module] allows the product to operate at maximum speed. It uses its internal backplane as the high-speed data path between the Ethernet's."

The unit has five slots and allows bridging and routing of as many as 20 Ethernet LANs or as many as 16 LANs to an FDDI backbone. It performs like an Ethernet switch by offering the ability to create more efficient links to network servers or multiple subnetworks for segmenting power users.

The bridge's buffering func-

Fast FDDI Bridge from Fiberbus



Fiberbus's FX5700 multimodule bridge can use up to 5 RISC processors to support as many as 16 Ethernet LAN high-speed connections to the FDDI backbone.

tion uses custom logic and high-speed Advanced Micro Devices Inc. processors to enable an Ethernet-to-FDDI filtering rate of more than 500,000 pps. It examines each data packet, dropping from the network those with corrupt data or bad addresses.

"This eliminates the possibility of bad data packets slowing network performance," Storozum said.

The product also offers rout-

ing capability over the full suite of IP routing protocols and comes with integrated SNMP-based management software. Future support for Token Ring also is planned.

The FX5700 is available now, priced starting at \$16,000. Options include three different Ethernet cards, FDDI, and redundant power supply.

Fiberbus of Chatsworth, Calif., can be reached at (818) 709-6000.

ProServe gains Windows 3.1 interface

By Torsten Busse

Tecmar Inc. is adding a Windows 3.1 interface to its ProServe backup and archiving software for NetWare networks.

Due to ship in the second quarter, ProServe2 will be implemented as a NetWare Loadable Module (NLM) under NetWare 3.11.

The product allows users to centrally administer data backup and restore operations, Tecmar vice

president of marketing.

ProServe2 is composed of several elements. The Backup Manager provides the graphical user interface for administrative functions, file selection, and scheduling; the Backup Server operates and interfaces with the backup hardware. ProServe2 is multiprocessing and capable of accepting data from multiple sources.

The software is designed to be backward compatible with Tecmar's ProServe DOS-based backup package and Cheyenne

Software Inc.'s ARCserve 4.0.

The 10-user version of ProServe2 is priced at \$495, and the unlimited-user version costs \$1,495.

ProServe2 supports Tecmar's ProLine DataVault four-card digital audio tape (DAT) system, offering up to 16 gigabytes of storage.

DataVault 4X4 supports network backup at 20 megabytes per minute. Pricing starts at \$8,995.

Tecmar, in Solon, Ohio, can be reached at (800) 624-8560.

Trellis' Remark lets Lotus Notes users hear what they're missing

By Doug Barney

Network integrator Trellis wants users to listen to Lotus Notes documents.

The firm is tying its Remark voice annotation system, which uses a telephone rather than add-on microphones — to Lotus Development Corp.'s groupware product, Remark, developed by Simpact Associates Inc., in San Diego, will also allow any Windows document to be voice annotated.

Unlike many voice systems, Remark connects directly into the LAN and the phone system, allowing users to hear annotated messages without a sound board, microphone, or speaker. Users can capture conversations, such as conference calls, and append them to a related document, spreadsheet, or other Notes object.

Remark's installation into Notes could cost tens of thousands, said Bill Fitzgerald, Trellis vice president of sales and marketing.

A large brokerage house in New York is installing a Trellis/Notes system so analysts can

distribute verbal stock recommendations rather than flat text bulletins, Fitzgerald said. A telecommunications firm is considering whether the voice annotation will entice executives into using Notes, allowing them to use a telephone rather than a keyboard for input.

To insert a voice annotation, the user moves the cursor to the selected location, double-clicks on the Remote icon, and clicks on Record. The system prompts the phone to ring, and the user simply picks it up and speaks. To play a message, the user simply clicks on a telephone icon within the document and picks up the phone. Each minute of speech requires about 180K of storage.

The system requires the Simpact ST3000 voice server for the phone and LAN to work together. The entry-level system, with the voice server, sells for \$5,600 and can support 100 users. Trellis consulting and integration with Notes is extra.

Trellis, in Princeton, N.J., can be reached at (609) 987-0660. Simpact is in San Diego at (619) 565-1865.

Product Spotlight

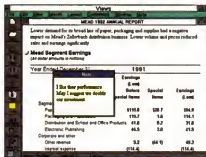
Publishing system allows simultaneous access

Folio Corp. will ship in March an upgrade to its LAN-based on-line electronic publishing system, which provides DOS and Windows users with simultaneous read and edit access to databases.

Folio Views, Version 3.0 manages databases of information called infobases that may contain text, numbers, scanned images, and multimedia objects. Each infobase is hardware dependent up to 16 terabytes, the Provo, Utah-based company said. Data can be edited by as many as 255 concurrent users.

Priced at \$495 per user, Version 3.0 features WYSIWYG viewing and editing. A Macintosh version will be available in the third quarter.

Folio can be reached at (801) 375-3700.



*Don't miss the industry's most respected
forum on Information Technology*

International Data Corporation Announces

DIRECTIONS '93

Charting the Course of Information Technology

One thing is certain in this constantly changing, dynamic world of information technology. You'd better be *well informed* if you expect to remain competitive in the 1990s.

As the economy cools off and the competition heats up, it's imperative that you devise a strategic business plan that will position your company in the years ahead. It's even more imperative that this plan be based on the most reliable, insightful, and conclusive market data available today.

For the past 28 years, International Data Corporation, the world's leading research firm on information technology, has been delivering strategic guidance to the leading players in the IT industry through its highly respected *Computer Industry Briefing Sessions*.

Directions '93, to be held in March, will be IDC's biggest and most authoritative forum ever. In one information-packed day, you'll hear from the industry's top analysts as they evaluate the state of the industry today and probe into the issues and trends of tomorrow.

So register early and be assured of a seat at the forefront of the information technology industry.

To register and for more information, call:

1-800-343-4952

Thursday, March 4, 1993

Santa Clara, CA

Santa Clara Convention Center

Wednesday, March 10, 1993

Boston, MA

Hynes Convention Center

Directions '93 Agenda

- ◆ Industry Restructuring - The IDC Perspective
- ◆ IT Spending
- ◆ Computer Industry Wars

Track 1 - Rightsizing the Enterprise

- ◆ Rightsizing in the Data Center: Choices and Opportunities
- ◆ Evolving Network Architecture
- ◆ The Services Industry Gold Rush
- ◆ Rightsizing War Stories: Lessons for Success

Track 2 - Personal Systems

- ◆ Tomorrow's Trends in the PC Systems Market
- ◆ PC Software Confronts the Enterprise
- ◆ Messaging and Advanced Group Applications
- ◆ Channel Management in the 90s

Track 3 - Winning the Midrange Wars

- ◆ Rightsizing for Technical Computing
- ◆ Are Midrange Systems Commodities?: A Survival Guide
- ◆ As the Unix Battles Rage, the War with NT Looms
- ◆ Midrange Contradictions

Track 4 - Networking

- ◆ Customer Directions: Managing Networking Investments
- ◆ Network Applications: Mobile Data Networks Add Another Dimension
- ◆ Local Area Networks: The Platform for Distributed Processing
- ◆ The Access Boundary: Understanding the Edge of Network Intelligence

Track 5 - Global Markets

- ◆ The New Europe: Opportunities and Obstacles for IT
- ◆ Latin America's New IT Markets
- ◆ Opportunities in the Asia/Pacific Region
- ◆ Worldwide Market Evolution - A Perspective on Japan



IDC

INTERNATIONAL DATA CORPORATION • 5 Speen Street, Framingham, MA 01701

Ungermann-Bass module will control its AccessOne hubs

By **TORSTEN BUSSE**

Ungermann-Bass Inc. will next month enable its AccessOne enterprise hubs to be controlled and monitored via any SNMP-based management system.

In a related announcement, Ungermann-Bass also released a remote configuration upgrade to its NetDirector network management platform. It lets users specify that devices in a domain be managed by a particular server.

In addition, server download enhancements enable users to remotely download network devices' configuration parameters and operational software.

Ungermann-Bass' add-on Ethernet Supervisor module, the ASM701, offers local intel-

ligence for real-time monitoring and control of all AccessOne system modules. It also watches and controls all of the attached Ethernet, Token Ring and FDDI networks from within the hub, said Didier Moretti, general manager of the network management unit at UB.

The module is hot-swappable: It can be replaced without shutting down the hub. It features flash EPROM, which includes clients for BootP, the standard broadcast mechanism in TCP/IP networks.

This addition allows a network device to request its own Internet Protocol address and the Trivial File Transfer Protocol (TFTP), the standard download protocol in TCP/IP.

TFTP allows the Supervisor ASM701 module to boot over

the network from any TFTP server, such as Ungermann-Bass' NetDirector management platform.

Because the ASM701 module stores and receives operational and configuration files from on-board, nonvolatile memory, there is no need for a download server at remote locations, Moretti said. If a power interruption occurs, the module can reboot using the files stored in EPROM.

The \$3,950 ASM701 card offers a serial port for RS-232 or EIA-485 signals.

NetDirector 16.7 ranges from \$8,000 to \$19,500 depending on the number of nodes supported.

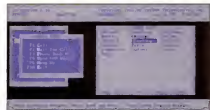
Ungermann-Bass, in Santa Clara, Calif., can be reached at (800) 777-4526.

Co/Session update is easier to install

Virtual port boosts Windows performance 25 percent

By **VANCE MCCARTHY**

Triton Technologies Inc. has improved the performance and installation of its Co/Session communications software, which lets DOS and Windows PCs and laptops remotely operate a second computer via modems or serial ports.



Co/Session 6.1 uses a modem or port to transfer files from a remote PC.

Co/Session, Version 6.1 has improved Windows performance by 25 percent by adding a specially designed virtual communications port and drivers, according to Jim Mulholland, Triton's director of channel development.

The 71K upgrade also automatically loads into high memory. During loading, the software checks to see if the PC offers sufficient capacity in its upper memory blocks. If less than 71K of high memory exists, Co/Session will load one of its two modules into high memory —

the host portion (41K) or the data portion (30K).

Co/Session 6.1 also can transfer files from the command line and supports dual remote printing. The capability to emulate VT100 and VT102 terminals lets users remap their keyboards and change colors, attributes, and printer destinations.

It also adds full support for Windows on Super VGA monitors.

Available now, Co/Session 6.1 is \$179 for a package supporting two PCs. Added host or remote modules are available for \$125. Upgrades for current Co/Session users are priced up to \$60, depending on their version.

Triton, in Iselin, N.J., can be reached at (908) 855-9440.

LANQuest offers automated network stress tests

By **TORSTEN BUSSE**

LANQuest Labs, an independent testing lab for networking products, is expanding its business and will offer a family of testing products targeted at end-users and systems integrators.

The company will offer a series of automated test suites that allow users to perform stress tests of networks at the component, node, network, and internetwork layers, company officials said.

"These products are not intended to replace network

diagnostic tools such as protocol analyzers but are designed to complement them," said Robert Buchanan, general manager of the San Jose, Calif.-based company.

The first product, called FrameThrower, is available now starting at \$3,000. The software allows managers to create network traffic and test and diagnose their networks' performance, leaving the data capture and analysis functions to a protocol analyzer.

The idea is to allow users to replicate network problems that are due to load distribu-

tion, Buchanan said.

FrameThrower runs on AT-compatible PCs. It is a multi-protocol packet generator for Ethernet and Token Ring LANs that works in conjunction with a protocol analyzer.

Early users are employing the software for multisegment testing of bridges and routers, Buchanan said.

Test suites for controlled load testing at the application, session, and transport level will be released throughout the year.

LANQuest can be reached at (408) 894-1000.



Coactive's connector has a Motorola processor and memory on board to support PC-to-Mac sharing.

Do-it-yourself connector easily links Macs, PCs

By **VANCE MCCARTHY**

less than 5 minutes.

The smart connector, with its own 32-bit microprocessor and 256K of memory, attaches to the PC parallel port without setting switches. It has been designed to determine which network drivers and user directories are needed and load them.

Users' network tasks are executed with standard DOS, Windows, or Mac system software commands, avoiding the need to learn new commands to share files and printers.

The product can be linked to existing Ethernet or Token Ring networks and is compliant with Apple Computer Inc.'s AppleTalk protocol.

Coactive, in Belmont, Calif., can be reached at (415) 802-1080.

Compsoft programs provide connectivity for PenPoint

By **YVONNE LEE**

New products from Compsoft Services Inc. will allow pen computers to access corporate data on various platforms.

PenASCII and PenAPPC provide two-way data transfer and real-time interactive sessions between PenPoint pen systems and other computers.

The company has updated PenASCII, a terminal emulation product, to allow pen computer users to connect across serial lines. The product, which began shipping in November, previously supported sessions via modems only.

The PenPoint application lets users connect to any host using dial-up or serial links.

It supports Xmodem, Ymodem, Zmodem, ASCII, and Kermit file transfers.

A product for connecting to hosts on IBM SNA networks has just gone into beta testing and is due to ship in the second quarter, the company said. PenAPPC (Advanced Program-to-Program Communications) connects to IBM System/390s, AS/400s, RS/6000s, and PS/2s on SNA networks.

The client/server software allows pen computers to function as full APFC nodes and access services on those networks.

Compsoft said it will port both products, which run on the Intel version of PenPoint, to the Hobbitt version of the operating system.

PenASCII costs \$165, and PenAPPC will cost \$200.

Compsoft, in Greenwich, Conn., can be reached at (203) 531-8162.

LAN Talk / Paul Merenbloom



Don't get depressed about disk space — get compressed

Managing disk space is a chore for every LAN manager. No matter how we try to avoid it, inevitably the hard

disk becomes an electronic trash can. Byte by byte our wealth of digital resources is quickly whittled down. Electronic mail messages, half-finished word processing documents, and "demo" editions of software are often major contributors to wasted space. Plus, backup programs — either workstation- or server-based — often consume 1 to 6 megabytes of disk per day for their log files!

If you have the money, you can simply buy more disks. For the rest of us, there is the option to erase the files, archive them to tape, or copy them to diskettes.

Or you could "zip" them up. By compressing files effectively, you can create on-line archives.

As LAN administrators we have to walk a fine line between managing system (i.e., disk) resources and managing our user community. Unfortunately, while both are imperative, these two tasks are sometimes mutually exclusive. Asking users to delete files that haven't been touched for two years (or for permission to archive them) has often been met with less-than-glowing results.

If you can't afford more disk space, and the users are resolved to keep the file(s) on-line, consider the use of "on-line" archives.

Compression programs have been around for a long time, but have recently matured over the past year or so. Two products that have become de facto standards are Phil Katz's PKZip, now Release 2.04C (sold by PKWare Inc.), and Haruyasu Yoshizaki's LHA, Version 2.13 (available from the IBM/COM forum on CompuServe).

Both of the capability to compress one or more files into archive files. As you expect, the archive file is smaller (in bytes) than the sum of the original files — but what you might not realize is how significant the savings can be.

Although most word processing, spreadsheet, and database programs (which generate the majority of LAN-based data files) use tokenization techniques to reduce file sizes, often there is still a great deal of "wasted" space.

Programs such as PKZip and LHA analyze each file's contents and compress them even further, recovering otherwise "lost" space. During the compression process, the Cyclic Redundancy Check (CRC) calculates the "check value" for each entry (file) and is stored along with the file in an archive. The "check value" is again calculated when the archive is decompressed to validate that the decompressed file is the same as the precompressed file.

To give you some sense of what to expect, I compressed several files, and here are the results: EXCEL.EXE (original size of 2,740,736 bytes) compressed to 1,577,850 bytes using PKZip (a 43 percent savings) and 1,619,054 bytes using LHA (a 39 per-

cent savings). A WordPerfect file of 33,232 bytes shrank to 12,326 using PKZip and 12,869 using LHA.

In a more general test, I compressed a directory containing one of the archive programs. The files in the directory occupy 740,000 bytes and contain program, text, and parameter files. When compressed, these files were 145,000 bytes!

In addition to saving file space, PKZip and LHA let you create a "wrapper," which enables the archive to automatically decompress without the use of any special tools. End-users don't have to be computer people to get their files back.

Several of these compression suites include programs that enable you to shrink executable files into archives while re-

taining the ability to run the programs without decompression!

Priced between \$20 and \$50 for individual use and \$10 to \$40 per PC for corporate use (you license the number of machines that will run the code), these programs pay for themselves in no time and should be a part of every LAN manager's toolkit.

Free Seminar on CD-ROM and Multimedia Publishing

Call 1-800-229-2222 to attend a remarkable half-day seminar that gives you a closer look at real world applications, benefits, costs and shows you how to evaluate and get started in this exciting technology.

Now you can get an inside look at the latest in CD-ROM and multimedia publishing.

The seminar is sponsored by Dataware Technologies, the world leader in CD-ROM software and services, and Emerging Technology Applications, the CD-ROM publishing unit of IDG, the world leader in providing information on information technology.

Together, they'll show you how your company can save money, make money, and give you a complete understanding of the benefits of CD-ROM and multimedia publishing.

Look at real world applications

You'll see exactly how leading companies are using these technologies today. And gain a better understanding of how your company can profit from them.

You'll learn how to get started; the title development process; how to choose software and hardware, and benefit from the experience of other companies who are already using

CD-ROM and multimedia as a competitive advantage.

Look at new technologies

You'll discover new ways to work with CD-ROM. Like cross-platform publishing which allows you to distribute one disc that runs on DOS, Windows, Macintosh and UNIX; CD-Recordable which enables you to create a CD-ROM disc at your desk; portable multimedia players, and more.

Look at interactive demonstrations

You'll see a detailed demo of the new Enterprise Computing Database which features full text and graphics from Computerworld, Network World, and InfoWorld, the industry's leading information technology publications, as well as demonstrations of other popular applications.

Look at all you get

You'll take home a free copy of the Enterprise Computing Database demonstration disc.

And The Guide to Optical Publishing, a 39-page industry report which

shows you how CD-ROM can benefit your company, how to estimate costs, application development, hardware selection and much more.

Look at your schedule

The seminars are absolutely free. Just check the seminar you wish to attend, and then call Dataware Technologies at 1-800-229-2222. Or fax it to 1-617-621-0307.

FREE! The Enterprise Computing Database



Now get a chance to sample the power of CD-ROM with unlimited access to the most recent six months of information.

The Enterprise Computing Database is a comprehensive source of news, product reviews, industry summaries and more, with fully indexed text of over 35,000 articles from Computerworld, Network World and InfoWorld plus over 2500 research summaries from leading IDG research companies.

Six months of information is yours free when you attend any of the CD-ROM and Multimedia seminars.

Seminar Reservation Form

- ☐ Yes, I'd like a closer look. Please reserve a place for me at the seminar I have checked.
- ☐ No, I cannot attend the seminar, but I am interested. Please have a representative call me.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

FAX this Seminar Reservation Form to 1-617-621-0307

1W

Paul Merenbloom is manager of information technology at Otsuka America Pharmaceuticals, in Rockville, MD. Send comments to him via CompuServe at 70743,3524 or via MCI Mail at Paul Merenbloom.

network
WORLD
NETWORK WORLD
COMPUTERWORLD

ETA
Emerging Technology Applications
An IDG Company



DATAWARE
TECHNOLOGIES

All brands and product names, trademark or registered trademarks are the properties of their respective companies.

TO THE EDITOR

INFO
WORLD

The gate's closed

Your story, "Gateway 2000 failing to meet service demand," (January 18, page 1) did not go far enough. My Gateway crashed on January 4. I have never been able to get a technician on the phone. When I finally reached a salesperson, he promised a technician would call. It was 17 days later, and, no call.

If Gateway's suppliers responded to them the way they respond to their customers, they would find a new supplier. If Gateway president Tom Wait bought a car, had problems with it, and the dealer's phone was constantly busy, he would be outraged and he'd probably find a new dealer for his next purchase. You cannot treat customers the way Gateway does and not lose them.

Stephen H. Raffel
Senior Vice President
Harrington, Richter & Parsons Inc.
New York

Human factors

I would like to applaud Mr. Koenig's decision to hire a physically challenged administrative analyst. (See Peer to Peer, November 23, 1992, page 39.) His capability as a manager to see her abilities and not her inabilities is a rare quality that I have not often found in the workplace.

Mr. Koenig addresses the fact that the Americans with Disabilities Act calls for the removal of all barriers to the disabled. But there is one barrier that ADA cannot remove: the attitude of "normal" people toward the disabled. You see, I am disabled, have been working for 12 years, and have run into this barrier on several different occasions.

The point I want to make is that all of the adaptive aids and high-tech hardware and software is not going to stop discrimination of the disabled. I'm tired of narrow-minded people looking at my wheelchair and inability to walk instead of looking at my abilities to perform a job and do that job well.

Harry M. Webb Jr.
Computer Programmer/Analyst
NASA, Langley Research Center
Hampton, Va.

Speed bumps

I just finished reading the January 25 issue and your review on 486DX266 servers (page 58). I am a bit confused. The IBM system says it is a Model OLF, which is a DX2/50. Also, in the features listing, it says the IBM was a 50-MHz system. Yet, you fault the system for being 23 percent slower, while its actual clock speed is 24 percent slower.

This difference would have put the IBM system right near the top, if not at the top. The fact that you do not even mention this major difference questions the overall reliability of your testing. If IBM could not provide a DX2/66 machine, then you should have noted it included it or more fairly used a real DX/50, which would have more closely performed to the rest of the tested machines.

Keith Luken
Marietta, Ga.

The IBM OLF uses a 50-MHz 486DX, which should have given it a slight performance advantage over the other systems in the comparison, which were based on the clock-doubled 66-MHz DX2.

As the introduction explained, what counts in file server performance is I/O, and I/O in the IBM ran at the full 50-MHz of the system bus as opposed to the 33-MHz bus speed of the clock-doubled DX2 machines. When we held everything about a machine the same but changed the processor, the 50-MHz 486DX outperformed a 66-MHz DX2 by a few percentage points. — Editors

The draw of local bus . . .

I read with absolute amazement the January 25 column by Steve Gibson (page 39) that there is no need for a 32-bit local bus in any of the primary functions in our PCs. Yet I have been seeing all the great benchmarks about improvements in our video performance.

Is there some kind of a false advertising somewhere to get us hooked onto a new fad called the local bus, or is it that Mr. Gibson has oversimplified his explanations so much that his calculations are incorrect?

Mason Cheng
Lehigh University

. . . stalls out

I just read Steve Gibson's latest article on the "screaming 32-bit local bus" and am a bit confused. I followed the discussion until he began talking about video, in which he drew the conclusion that the local bus is no faster than the ISA bus. I haven't seen any of these new systems in person, but I've seen various benchmarks that seem to show a threefold improvement in video performance.

What kind of test(s) are you running, and why are you getting such radically different results? Do your tests span the range of current processor options (20-MHz 386 to 66-MHz 486)? That is, can't a "screaming 32-bit" 66-MHz processor perform better with local bus video than a 20-MHz model?

This is very important to me because I am in the middle of a purchase decision.

Kirt Johnson
MCI Mail: 281-6320

Gibson replies: I should have been clearer about my assessment of the impact of the local bus on video performance. New chips are springing from the silicon foundries so fast that it's probably impossible to count "generations." However, the most recent generation of chips that I've tested neither require nor take advantage of the extra speed of the local bus.

I do believe (based only on what I've heard) that the next generation of "real fast" chips will be hungry enough to see serious benefit from a local bus connection.

In the meantime, be very circumspect

of benchmark results! It's very easy to find what you hope see. I'll be discussing these factors in future columns.

Save those fingers

The letters to the editor from Don Elefante and David Karp in the January 18 issue (page 42) prompted me to remind you of a product that we developed years ago called Magic Fingers. It was also released under the name Abbreviate about three years ago.

This package provides a feature called abbreviation expansion, which allows the user to define abbreviations of up to eight characters in length. The abbreviation can stand for an expansion of up to 250 keystrokes in length, including all the keys on the keyboard. Thus, you might define "tyfl" to stand for "Thank you for your letter."

This abbreviation technique is in wide use by persons with disabilities through our primary software packages. We sold several hundred copies at \$39.95; fortunately we weren't depending on it to survive!

Walt Woltoz
President
Words+

Compatibility point

I would like to correct an inaccurate bit of speculation in Robert X. Cringle's Notes From the Field column of January 25 (page 86). We are flattered that IBM is reported to have considered, but rejected, the idea of bundling our PC-MOS with its new ValuePoint product line. However, we take strong exception to the assertion that PC-MOS is not compatible with the ValuePoint.

We have worked closely with IBM to ensure compatibility for these machines, which reject our of large customers (specifically in point-of-sale environments) are evaluating. In working with IBM, we identified a bug in the 386SLC chip, which is used in the ValuePoint.

Technically speaking, the problem occurred when using a combination of 16 JMP or CALL instruction when in a 32-bit mode. PC-MOS contains a combination of 32-bit and 16-bit code in Assembly routines.

IBM has acknowledged the bug and corrected it, and the company assures us that the corrected chip is in production. This means that all current 386SLC chips, and therefore the ValuePoint product line, are corrected and are compatible with PC-MOS.

Rod B. Roark
Chairman
The Software Link
Norcross, Ga.

Please write to Letters to the Editor, InfoWorld, 1555 Bove Road, Suite 800, San Mateo, CA 94402; (MCI Mail: 259-4127; CompuServe: 73267-1537; Internet: Letters@InfoWorld.com). Letters may also be faxed to InfoWorld at (415) 358-1269. Please include your name, address, and daytime telephone number. Letters selected for publication will be edited for length and clarity.

Editor-in-Chief
Editorial Director
Editor
Assistant to the Editor-in-Chief

Shewart Ash
Michael Lowe
Ed Foster
Kurtin Auster

NEWS & VIEWS

Executive Editor Robert Jones
News Editor Kathy Guffy
Opinion Editor Rachel Parry
Editor of Large Scott MacKenzie
Associate News Editor Caroline Carr
Senior Editors Doug Barlow (Boston)
Jan Hammett (Software), Doug McCarthy (Hewlett-Packard), Tom Quinan (Hewlett-Packard), Hans Stephens
Bureau Chiefs Stuart Johnston (Seattle), Steve Polak (Dallas)
Ed Scarnell (Boston)
Assistant News Editor Karen Pennington
Senior Writers Jennifer Berens, Cheryl Gerney, Yvonne Lee
Briant Willett (Business), Jayne Wilson (Boston)
Research Editor Janet Gelling
Reporter Terence Buse
Editorial Assistant Rita Orange
Text Center Administrator Shirley French
Field Editor Robert C. Crangy
Contributing Editors Cheryl Cunniff, Steve Gibson
Brent Gies, Brian Livingston, Paul Merenski, David Soren

ENTERPRISE COMPUTING

Executive Editor Ryan Scott
Senior Editor Doug van Ryn
Contributing Editor Alice LaPlante

REVIEWS & TESTING

Executive Editor Kevin Ström
Reviews & Testing Manager Dan Sommer
Reviews Editor Carla Mathews
Text Center Administrator Steve Van
Team Leaders Anne Kalcick, Associate Editor (Multimedia, Networking)
Andrew Ruffa, Analyst (Communications, Communications)
Nicholas Penney, Senior Editor (Enterprise)
Dave Winkler, Test Developer (Hardware, Systems)
Jill Welch, Analyst (Text and Graphics)
Senior Test Developer Peter Chai, Test Engineer
Text Developers Victor Garza, Vitek Negushev, Rod Rungt
Associate Editors Nyla Carlson (Text and Graphics)
Ann Marcus (Communications, Communications)
Suzanne Nash (Hardware, Systems)
Assistant Editor Karen Brophy (Reviews)
Senior Systems Analyst Nancy Osterlind
Systems Analyst Laura Worscott
Technical Analyst Earl Anglin, Rod Chaban
Patrick Lyons, Jeff Symons, Jeff Van Cura
Andrew Munk, Tim Zittle
Network Administrator Rodney Gustin
Inventory Controller Arlene Munk
Administrative Assistant Lana Simon
Contributing Editors Denise Green, Doug Green
John Lombard, Patrick Marshall, John Wollenbach

EDITORIAL PRODUCTION

Managing Editor Bob Kayne
Art Director Terica Barbara
Associate Managing Editor Bianca Hanley
Associate Art Director Sarah Berchuck
Chief Copy Editor Becky Fred
Illustrator Bob Grier
Copy Editors Bob Grier, Glenn Bonner
Wittien Kimball, Stephen Lawson
Layout Designer Lucy James
Contributing Photographer Gerald Zager
Pre-Production Editor Marvyn
Post-Production Assistant Sasha Alexander

EDITORIAL EVENTS

Director La Lorenzano
Specialist Terina Hane
Coordinator Tracy McGee

CORPORATE ADVISORY BOARD

Sally Atkins, John Chapman (Amnco), Marilyn Henry (APCUI), Bob Holmes (Southern California Gas), Forrest Jensen, Colgate-Palmolive, Philip Koch (Pepsi-Cola), Karl Norrington (Shell), Sheldon Laube (Price Waterhouse), John L. Rickard (Federal Express), John Seavers (Federal Hammer), David Tenslow (Southern California Edison), Douglas E. Welch



From the Editor / Ed Foster

I need a Pentium like a Hyundai needs a jet engine

I don't know about you, but I feel distinctly unprepared for the 64-bit age.

With the Pentium chip due out shortly, you would think I'd be pawing at the turf in anticipation of getting my hands on one. But the fact is, I'm not sure it's going to do me a lot of good (assuming I can persuade Stewart to let me buy one, which is not a given).

Like a lot of folks still using Intel-based systems, I'm not even really in the 32-bit world yet in terms of the software I run. I'm running mostly 16-bit, or even 8-bit software, I'm probably typical of many of the users on your networks. A Pentium machine no doubt would juice up some of my Windows operations, but I suspect the overall performance gains I'd get would be minimal.

Almost everything I do with the applications that reside on my system is accomplished almost instantaneously anyway. I'm not going to notice a big difference in my word processor or my spreadsheet.

What does take time is any operation that has to go over the network. It's not like there are any commands on our E-mail or our highly vaulted publishing system (I'm still waiting for that I-told-you-so disaster) that give me time for a coffee break. Still, if you counted up all the 20- to 30-second intervals where my cursor has turned to the little PC-talking-to-server-time-out icon, it would add up to a significant amount of time each day.

So I naturally assume that our first Pentium machine won't go on my desk but will be used as a



server. Even there, though, I'm not sure it will make a big difference. As our product comparison of high-performance servers a few weeks ago made abundantly clear, a faster CPU on your server doesn't always mean a faster network. In our tests, a 486 server running at 50 MHz or 66 MHz offered only a few percentage points performance boost over a 33-MHz machine, and it was only with a lot of workstations working under an abnormally heavy load that we even noticed that difference.

Now, the typical rationale for why this situation exists is to say that the software side of the industry isn't keeping up with the hardware. There's some truth to that. Software that took any advantage of the 80286 didn't appear until long after that chip had supplanted the 8086/88 as the dominant PC architecture, and even now we're not taking full advantage of the 386, much less the 486.

With each new version of the Intel architecture, the gap between the chip's potential and the capability of the software most of us use just keeps getting wider. Once you've got a Pentium on your desk, it's going to feel like using an HDTV set to pick up old radio broadcasts.

But who is really to blame for this? Software isn't keeping up with the pace of change in the hardware, but when you look around the industry, it's the hardware companies that are really hurting. Meanwhile, the software companies are really cleaning up.

Microsoft has been raking in the big bucks the

last few years in large part because of Windows, which arrived in usable form about five years after we first needed it for the hardware we had. Novell, the first company to deliver a server-based operating system that could take advantage of the 286, is still in essence making its living off of that long-ago success. Both firms are prospering today on technology they had on the drawing boards almost a decade ago.

It's not like we didn't have other choices. Unix in its various Intel-based flavors has been around almost from the day the 386 started shipping as a 32-bit operating system, and it has some obvious advantages as a server operating system. It was always too clunky for the desktop, though, so we could never warm up to it.

What it amounts to is we really shouldn't blame the software industry for falling behind. We're the ones who have been content with software products that didn't take full advantage of the hardware we've been buying. If we're going to keep rewarding the wrong guys, we've got no one but ourselves to blame.

I apologize for those of you who had trouble getting through to our gripe line last week; we had some confusion as to which extension to use. The proper number is (800) 227-8365, Ext. 710. Let us know the problems you're having with products and vendors, and we'll see what we can do to get some action for you.

Ed Foster is editor of InfoWorld. He gets electronic mail at MCI account 397-4470.

Peer to Peer / Stan Polinsky

Beta-testing veteran offers troubleshooting tips from the trenches

Stan Polinsky is a software quality assurance specialist working in Westlake, Calif., and a frequent software beta tester.

This column attempts to provide some tips and techniques — from a beta tester's view — for when things don't go right with your personal computer.

First, what does a beta tester do? Basically, the beta tester is part of a complex network of people making sure that a package hits the market with as few latent defects as possible.

Testing starts when the programmer performs unit testing for each function or compound statement in the structured (human-readable) source code. Later in the process, multiple units are combined to see how they interface. In the final level of "factory" testing, the developer tests the package for compliance to the requirements.

Up to this point, all the testing is done by folks who are intimately familiar with the product. They may miss some obvious flaws. So, most organizations use beta testing; they give a limited number of users outside the company prerelease copies of the software. The beta testers use the software in normal work and report repeatable problems.

Typically, beta testers find bugs and applications for the program that the developers never dreamed of. Therein

lies the rub: Beta testers are like war veterans. Every new release is a new battle. We know a lot about troubleshooting because of all the times we have been burned by prerelease software.

When troubleshooting, first examine the steps leading up to the problem and alternative steps. Use a "vanilla boot disk," or a bootable floppy disk, that contains the minimum lines in the CONFIG.SYS and AUTOEXEC.BAT to get the computer running. If the computer

have to edit and save the CONFIG.SYS and/or AUTOEXEC.BAT files, adding or subtracting items one line at a time.

Happily, MS-DOS 6.0 contains two wonderful features that can reduce the troubleshooting process by an order of magnitude. The first enhancement is the F5 key, pressed sometime when "Starting MS-DOS" appears on the screen. This allows the PC to boot while bypassing the CONFIG.SYS and AUTOEXEC.BAT completely, proving the PC is

you should comment out each line of the AUTOEXEC.BAT one at a time and reboot, similar to using the vanilla boot disk. This should get you to the problem sooner. If not, some part of your hardware may be in trouble, or one of your applications may have corrupted files. Going through the AUTOEXEC.BAT usually helps to find the bad guy. When at all possible, use Ctrl-Alt-Del to reboot your PC; you could flush your cache if you use the reset button or power switch.

The golden rule to follow when making changes, optimizations, improvements, or additions to your PC is: Only make one change at a time! Save a backup copy of your CONFIG.SYS and AUTOEXEC.BAT before changing anything. (If you are using Windows, also make a backup copy of your WIN.INI and SYSTEM.INI, as well.) Always have a parachute available in case you have to bail out. Test each change to re-establish confidence in your PC before making more changes. Following the golden rule will usually save you hours (or days) of time. (Trust me, I know.)

"Peer to Peer" gives readers a forum for discussing computing and management issues. Send submissions to: Rachel Parker, Opinions Editor (MCI Mail 340-4371). Submissions can also be faxed to (415) 358-1269.

The golden rule for making changes, optimizations, improvements, or additions to your PC is: Only make one change at a time!

boots, this may eliminate the possibility of hardware problems. Next, the drivers and programs are added, one at a time, and the PC rebooted each time a change is made.

When the problem pops up again, the last item added likely points to the source of the problem. This is analogous to "card elimination and substitution" in hardware troubleshooting.

Using a vanilla boot disk is tedious and time-consuming. For each boot you

bootable. Next, press the F8 key when rebooting and seeing the same message, "Starting MS-DOS." This process displays each line in the CONFIG.SYS file sequentially and prompts you for a yes or no to run that line or bypass it.

Think of the time that feature will save during troubleshooting!

After the CONFIG.SYS lines are executed, you are then prompted to run or bypass the AUTOEXEC.BAT. If you didn't find the source of the problem by now,

ENTERPRISE COMPUTING

BY NICHOLAS PETRELEY
AND DOUG VAN KIRK

In today's enterprise, it's not uncommon to find critical data spanning a wide variety of systems and formats — budget figures in Lotus 1-2-3, customer lists on an IBM DB2 database, and product information on a LAN-based SQL system. In years past, this wasn't a big problem; departments worked with their data and did not expect to access data in other parts of their company.

But in 1993, when profitability often relies as much on extracting value from information as it does on making sales, workgroups must not only share information but be able to examine and manipulate that information in a way to leverage their own expertise. It can be something as simple as giving a telemarketer instant access to all customer information or sophisticated analyses of business operations.

It's called adding value, but that's a tough trick when every group keeps data in its own format and uses proprietary or customized tools to manage it. Obviously, if you're starting a new venture, you can create an information infrastructure that provides this kind of flexibility.

But if you're stuck, like most of us, with the information you need scattered across different platforms and database formats, you need solutions that work now. We're talking about query and reporting tools that not only support a wide variety of database formats but are easy to set up and portable among a variety of platforms while providing a consistent and pleasant user interface.

In other words, it's time to take a look at your front end. Picking the right database front end isn't a simple task, but it's not as bad as dealing with the average foreign-car mechanic. Keep in mind your needs and don't be bamboozled by a lot of jargon or slick screens, and you'll do fine. Most importantly, recognize that no one tool may be right for all your applications. A front end that's terrific for acres of clerical workers entering data might be woefully underpowered for the analyst who wants to join tables and review margins on different business activities.

Database application development tools fall into three categories: procedural programming tools such as C and Basic, also known as third-generation languages (3GLs); 4GLs that combine procedural programming and programming techniques, such as Mozart, PowerBuilder, and SQL Windows; and object-oriented programming languages, such as Next-Step, C++, and ObjectVision.

These tools offer a wide variety of capabilities, letting developers create anything from simple database query applications to more sophisticated and complex decision support and transaction processing programs.

Query tools, such as Gupta Corp.'s Quest, are often the best choices for knowledge workers. 4GL tools, such as SQL Windows or ObjectVision, can help you build entire applications quickly but sometimes require you to sacrifice speed and flexibility in complex applications. Procedural languages, such as Pascal and C, may sound archaic in 1993, but combined with interface and database toolkits, these traditional programming languages can provide power, speed, and flexibility. However, they take longest to develop

Avoid the application development maze

Here are a few simple tips for picking the right front-end tools



applications and can be difficult to port to other platforms. What's more, they require the most skill from developers. If your organization doesn't have a lot of experience developing applications for Windows or the Macintosh, you will probably need to hire additional programmers, because retraining staff will take too long.

VERSATILITY. The right tool must support the databases you use, of course. But it should also support common database and file formats, even if you don't use them now. Access is empowerment, and empowered users quickly ask for more capability. So even if you only need Sybase and Oracle SQL database support now, chances are some wise guy in marketing will want to run some kind of operation against a Paradox file he's got on his PC.

Whereas query tools and 4GL environments tend to be quite specific about what back ends they support, procedural languages can be used with any back end. However, getting access requires either a database-specific application programming interface (API) or a driver. Companies such as Microsoft Corp. and Borland

International Inc. have put forth so-called "generic" interfaces that they hope will gain widespread developer support and become de facto industry standards.

Microsoft has released its Open Database Connectivity (ODBC) API, and Borland's proposed Integrated Database API (IDAPI) has won the preliminary support of companies such as Novell Inc. and IBM. Should either of these proposed standards gain widespread support, front-end tools will come complete with drivers for these interfaces, giving programmers plug-and-play access to a variety of back ends.

Mark Herzog, senior analyst at Natural Gas Pipeline, in Houston, is banking on ODBC to provide the greatest flexibility in choosing front-end tools. Herzog hasn't picked a database server for his current project, but he is already investigating front ends. He expects to use ODBC drivers for SQL Server, Sybase, and Oracle.

The downside to any of these de facto interface standards is that they offer only the lowest common denominator. If you adopt ODBC, it could be difficult or impossible to take advantage of special vendor-specific features of database servers,

such as stored procedures and triggers. "You will always lose some kind of vendor-specific functionality at the interface with a generic driver API," says Robert Perreault, vice president of Richard Irwin Associates, a Los Altos, Calif., consultancy. "You will almost always lose performance as well."

The alternative is to go with a product that offers custom drivers tuned for each back-end database needed in your environment. DataEase International Inc. takes this approach in its DataEase Express, using features such as the specialized browse mode for queries and updates in Microsoft and Sybase SQL Server. With the possible exception of Uniface Corp.'s Uniface, which offers custom drivers for an unusually large number of database formats, many products adopting this approach currently support only a few database servers.

DESKTOP POWER. No matter how flexible or powerful the system you create, it's worthless if users don't like it and won't use it. And you'll hear about it. The interface is all the user sees. As far as she or he is concerned, it is the system. A good

system with a bad interface shows lack of vision on your part and costs far more to support.

You may also need to consider the needs of remote users. A slick graphical interface that looks great on the desktop can run like molasses in Minnesota across dial-up lines. Graphical apps can be souped up somewhat with programming tricks (reduce the size of active windows, don't use bit-mapped icons), but to run a graphical application remotely with expediency, you'll have to code it with that in mind.

If that's too much work, you may want to fall back on an old standby — character mode. PC database vendors who have grown up with the industry understand this best. Most are loath to create products that can't run on the majority of existing PCs and LANs. Most of the popular file server databases, such as dBase, FoxPro, Paradox, and RBase, run in character mode and have relatively minimal hardware requirements. Front-end tools ported from high-end hardware platforms tend to be more hardware intensive and make the greatest financial demands on users.

A character mode interface isn't necessarily a bad one, and both Borland and Microsoft provide character user interface tools that work with their programming languages.

Another approach is to use a tool that supports a wide variety of environments but uses only those interface elements common to all. Uniface is a good example. It provides GUI intuitiveness without full commonality. This front-end development tool lets programmers create applications that run on most of the popular desktop operating systems, including DOS, Windows, and Unix running Molt. Uniface ports seamlessly across these platforms by adopting a generic look and feel that moves easily between character and graphical mode.

"We could take the Uniface product into a VAX VMS environment running simultaneously on PCs and character mode terminals," says Larry Laux, president of Metrix Customer Support Systems, in Milwaukee.

If your desktop systems are limited to Windows and Macintosh, other tools may be more appropriate. For instance, Om-

nis 7 from Blythe Software builds graphical applications for both and makes it easy to convert from one environment to the other. It has a graphical look and retains a high degree of commonality with Windows and the Macintosh.

CRITICAL SUCCESS FACTORS. Whether you work with characters or graphics, keep in mind: Users aren't dumb. They're familiar with commercial applications and very likely use Windows. That means your applications must conform to expected norms of performance and usability. A Windows-based front end, for example, must not only look like a Windows program, but it should act and perform similarly. It's hard to believe, but we've seen corporate applications with scroll bars that work backwards and entire programs written as dialog boxes that

application that requires too many steps to put together the information you need? That's bad design. And poorly designed programs, no matter how little they might cost you to develop, will end up costing you more money in the long run.

Successful development relies on several factors. The IS department must identify key business functions the new system will support and zero in on the problems the application is designed to solve. This starts with a critical look at the business itself. The logic behind an application should parallel the business activities supported. If it doesn't, redesign it. If the application can't follow the business, it may be time to examine the assumptions and procedures that drive that business function.

FRONT-END ALIGNMENT. The problems of integrating the new with old can never be entirely overcome, but the trade-offs are becoming increasingly manageable. Viewing the choice of front-end tools as a long-term investment can minimize costs. Here you must strive for stability, accessibility, extensibility, reusability, and maintainability.

Vendor and product stability is a easy goal to remember. Will the vendor of your front-end tools be around next year? And are they committed to enhancing their products to meet your changing needs? This goes hand in hand with maintainability. How hard is it to make changes to a production application over years of use?

Even when you have matched a front-end to a back-end database, there is always the chance that you'll need to replace one of the elements of your system. Can your application and development tools support this type of system evolution? "The No. 1 criteria is heterogeneous accessibility to data," Metrix's Laux says. "We want to be able to build new applications without changing the back-end so we can use existing data. No. 2 is accessibility of data. If the things underneath change, the application needs to be stable."

If the front-end tool doesn't always give you exactly the features you want, extensibility features let you add your own unique functions. The product that allows you to link in or call foreign code

(such as object files or Dynamic Link Libraries) provides insurance against unexpected requirements.

Products such as Uniface and Advanced Revelation are built around the concept of a data dictionary. As you define your dictionary, you define the behavior of your application. This approach provides a very structured means of development that generates reusable "code." Data dictionary applications can do much of the grunt work, taking over maintenance of the structured data.

Object-oriented programming and development promises long-term gains, as well. Many vendors have turned to object-oriented features to build up a library of reusable code. An object-oriented language such as C++ requires a large initial effort, but, "It's certainly worth the effort when getting [C++] objects written correctly," Werner says. "Once they're written right, they can be reused in other applications. It's investment up front for long term gain."

If you can afford the slower performance of a 4GL, programs like the latest version of Gupta's SQLWindows, for example, boasts object-oriented features as well.

When looking at on-going data maintenance issues, it's often more advantageous to build this data into the back-end database engine rather than on the front-end application. Surprisingly, it sometimes pays for the front-end tools to produce relatively ignorant applications that know little about enforcing integrity constraints on the data. The drawback to a data dictionary approach is that it usually precludes the intelligence of the application at the front end.

Business rules, relational integrity constraints, and data integrity checks are most efficient when enforced at the back end. This way, when changes are made to any of these rules, constraints, or edits, they are made only once; the new rules are applied globally to all applications using the data.

Ultimately, even the best front-end choices will only meet some subset of your long-term requirements. Until the perfect toolkit comes along, the challenge will be to prioritize your needs and find the program that best fits your business and system goals.

The responsiveness or speed of the interface is a critical factor.

could not be minimized or run in background mode.

The responsiveness or speed of the interface is also a critical factor. The subtle pause between operations that may seem only mildly intrusive at first rapidly becomes a major annoyance, especially if end-users spend a majority of their work time operating your program. "The smaller and tighter the executable, the better," says Robert Werner, a systems analyst for a major West Coast financial institution. Werner's firm chose ObjectView and C++ primarily because of speed. "What we looked about ObjectView is that it generated compiled code," he says. "Most of the others we looked at took more memory and were much less efficient."

How many times have you launched a new application only to feel yourself inextricably drawn into a labyrinth with no apparent way out? Or a program that takes forever to respond? How about an

A sample of front-end database development tools

Vendor	Product	Front-end platforms	Databases supported	Price	Distinguishing feature
Approach Software Corp. Redwood City, CA (415) 306-7890	Approach	Windows	Microsoft/Sybase SQL Server, and DB2 dBase, Paradox, FoxPro, Oracle Server,	\$399	Easy, intuitive visual application development for Windows
Gupta Technologies Inc. Marble Park, CA (415) 321-9500	SQL Windows	Windows	Gupta SQLBase, Microsoft/Sybase SQL Server, Oracle	\$2,495 and up	A powerful, intelligently designed outline-oriented visual application programming environment.
Metatrix Corp. Lakewood, CA (415) 925-2900	ObjectView	Windows	Microsoft/Sybase SQL Server, Oracle	\$1,499 and up	Object oriented, generates fast and efficient applications.
Muzart Systems Corp. Burlington, CA (415) 340-1588	Muzart	Windows, DOS, OS/2	Microsoft/Sybase SQL Server, Oracle, OS/2 EE, dBase	\$6,000	Application development tools, good cross-platform capabilities across Windows, DOS, and OS/2
Revelation Technologies Stamford, CT (800) 282-4747	Advanced Revelation	DOS	Microsoft/Sybase SQL Server, Oracle	From \$1,195	Complex but flexible application development
Uniface Corp. Alameda, CA (800) 365-3608	Uniface	DOS, Windows, Motif, Open Look, OS/2 Workplace Shell	DB2, Oracle, HP Turbo Image, HP Allbase/SQL, Ingres, Informatica, RDB, Xbase, Microsoft/Sybase SQL Server	From \$4,500 to \$250,000	Powerful application development environment, perhaps the most portable front-end toolkit available

ENTERPRISE COMPUTING / MANAGEMENT

IS managers called on to justify IS investments

Quantifying the benefits of client/server systems proves to be an elusive task at best

By DOUG VAN KIRK

When it comes to computers, you get what you pay for. Or do you? IS managers are increasingly being called upon to justify their investment in hardware and software and to explain how computer systems benefit the overall corporation.

Cost justification used to be exclusively a corporate issue. Typically, the chief information officer set goals, decided the fate of projects, and convinced upper management of the need to embark on new development efforts. IS managers and network administrators carried out the marching orders and were kept far from corporate budget battles.

However, as client/server architectures and networks moved budget responsibilities down through the IS ranks, more network administrators, help desk managers, and electronic mail gurus are being asked to demonstrate their contribution to overall profitability. Will a new application save the company money or expand its business? Converting a VSAM database to SQL may produce better response times and make it easier to build applications, but if the activity doesn't generate profits for the corporation, there may be no reason to proceed. It's not enough to keep mission-critical applications running 99 percent of the time, distribute timely upgrades, and outfit everyone on your staff with beepers for around-the-clock support.

Ironically, the demands to justify application costs are occurring just as corporations are finally accepting PCs as an essential component of business.

PC cost justification isn't so important anymore, says Greg Klein, MIS manager

of Lotus Notes have the potential to change business processes, says Christopher Tecer, an associate partner with Andersen Consulting, in Chicago. Current desktop technologies, such as word processing and spreadsheets, have made individuals more productive but added little to the bottom line. The computer industry is learning to focus on group productivity, he adds, and the next generation of products will leverage LANs and information to improve organizational rather than individual goals.

MEASURABLE GAINS. New types of workgroup applications may hunt much of the criticism now leveled at PC and LAN spending. Workgroup products such as Lotus Notes have the potential to change business processes, says Christopher Tecer, an associate partner with Andersen Consulting, in Chicago. Current desktop technologies, such as word processing and spreadsheets, have made individuals more productive but added little to the bottom line. The computer industry is learning to focus on group productivity, he adds, and the next generation of products will leverage LANs and information to improve organizational rather than individual goals.

Many companies need to reassess how they measure desktop productivity as these LAN-based systems move into the computing mainstream. Sara Lee Corp., for example, tries to determine the impact of new systems not only on direct users, but people likely to be affected downstream. However, MIS manager Klein admits that many of the processes used to evaluate mainframe systems, such as post-implementation reviews, are not well developed in the client/server arena.

While it's always easier to justify your existence when management is on your side, there are ways to determine if LANs are beneficial to your company.

First, attempt to associate system costs with specific business activities. Too many computing activities are expensed as overhead and that makes them easy targets for cost-cutters.

Second, avoid using technical measures



ument PC productivity gains is the way productivity is measured. "It's a very inexact science," says Darrell Balmer, vice president of the financial strategies services division of the Gartner Group, a Stamford, Conn., consulting firm. Traditional productivity measures are geared toward manufacturing, he explains, weighing inputs and outputs. This approach doesn't work well in a service-based economy because values are more difficult to quantify, and added value does not necessarily mean a higher price. In addition, activities of service companies are quickly copied by their competitors. He cites airline frequent-flyer programs as an example. The programs add value by increasing customer loyalty but aren't reflected in the price of airline tickets. As a result, there's little way of gauging the impact of such an activity on the bottom line.

Service organizations showing productivity gains generally attribute it to staff reductions. Because the only noncapital or nonfixed costs are personnel, layoffs are the only way to show an organization is more cost-effective. Carried to the extreme, the most productive IS department would be the one that shuts off the computer and locks the doors.

Balmer believes information technology's valuable contribution to the corporation is understated by traditional productivity measures. "Productivity is probably much better than it appears to be," he says.

EFFECTIVE MANAGEMENT. The way computer systems are implemented and managed can greatly affect the actual and perceived usefulness of information technology. Unlike mainframes, which are generally used on a charge-back basis, LANs and client/server applications are

usually capital expenditures. In the former, there is a cost associated with each transaction—it's easy to see computing costs as a component of a particular product or service. But departmental and enterprise LANs are generally treated as a common resource with a complex matrix of applications and users that makes charge-back nearly impossible.

Another reason IS productivity may appear to lag is the misapplication of technology. Aggregate productivity measures don't distinguish between effective implementations and misapplications of information technologies, notes Jim McGee of Ernst and Young's Center for Information Technology and Strategy, in Boston. McGee is coauthoring a book on effective information management.

Some organizations achieve immense benefits because they integrate technology into their business procedures and create new, more effective ways of doing things, McGee says. But companies that apply technology to existing business processes generally find that the technology makes only a minimum improvement or even has an adverse impact on the bottom line.

There are times when productivity may actually be sapped by desktop technology, Balmer says. Citing a phenomenon he calls "low-value work creep," he chastises firms for shunting administrative and clerical tasks to highly paid "knowledge workers" while eliminating less costly support staffs. This can produce an attractive bottom line but will reduce the effectiveness of professional employees and result in decreased productivity.

Like McGee, Balmer stresses that technology must be applied to appropriate business areas to achieve productivity gains. It's common-sense advice—which many companies fail to follow.

Smart ways to justify IS spending

- Clearly explain the overall impact new system will have on the business.
- Seek management support in early stages of project.
- Associate system costs with business activities.
- Avoid using technical measures, like response and processing times, to analyze performance.
- Don't build a cost-justification case around a single technology that's part of a larger project.
- Highlight non-monetary benefits (increased knowledge, better decision making).

of Sara Lee Corp.'s personal products division, in Winston-Salem, N.C. The benefits of PCs have been demonstrated to management, and prices are low enough that most PC purchases are approved without question.

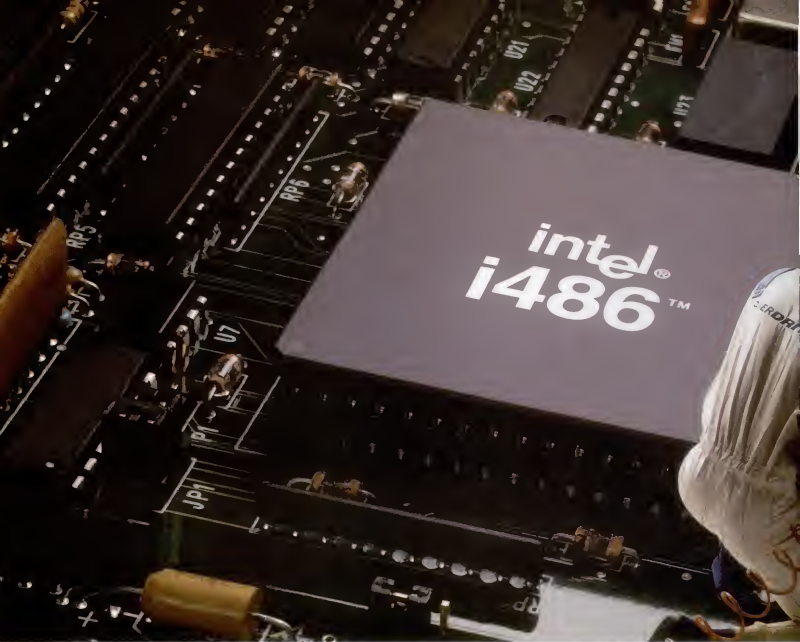
Applications and support are another story. A recent study by Nolan, Norton & Co., in Boston, indicates that annual spending on PCs can reach up to \$6,500 per user. With unanticipated factors such as development cost overruns, that amount can double.

Private and institutional studies of productivity show little or no gains in the office as a result of personal computer tech-

of system productivity. Improvements in response time, for instance, don't mean very much to management. On the other hand, the chief financial officer will be very interested to hear that the system can now handle an additional 400 trades per hour. That's an asset that can be put into use immediately.

Finally, don't attempt to cost-justify a technology. The results will be narrow and fleeting. Instead, look at the process. Recognize the enabling power of LAN technology to alter business processes, and sell management on the improvements that come from such a change.

Part of the problem with trying to doc-



To run all your applications you make a

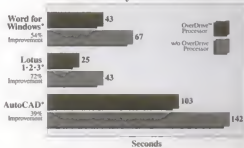
Introducing Intel OverDrive™ Processors for your i486™ DX PC.

Pull in your i486 DX or SX system. Drop in an Intel OverDrive Processor. Flip the switch. And you'll come screaming out of the pits with plenty of added power.

It's that easy. Because the OverDrive Processor is so simple to install. Just plug it into the vacant OverDrive Processor socket, close the hood and you're done.

Then, using Intel's ingenious "speed doubling" technology, the OverDrive Processor will give

i486™ DX System Performance





cations faster, we suggest quick pit stop.

you up to a 70% performance boost systemwide. Added power that will benefit every application you run on DOS, OS/2, Windows, or UNIX—from AutoCAD to WordPerfect and over 50,000 applications in between.

**WE MAKE
COMPUTERS
WORK
HARDER.**

Find out more. Ask for ext. 236
1-800-538-3373

So to rev up your i486 PC and keep up to speed on all the latest software developments, you need the future of PC upgradability: Intel OverDrive Processors. To find out which OverDrive

Processor is right for your system or to locate your nearest dealer, call 1-800-538-3373, ext. 236. That is, of course, if you want the fastest PC on the track.

intel.

Case Study

Colgate goes global with integrated E-mail strategy

By ALICE LAPLANTE

A truly seamless electronic mail system that links corporate offices worldwide remains a dream at many large companies, but at least one organization is turning this dream into reality. For the past five years, Colgate-Palmolive Co. has been linking dozens of incompatible E-mail systems at locations around the globe. Now employees can send messages and exchange files regardless of where they are or what platform they use.

This goal seemed ambitious when it was conceived in 1987, given that Colgate — like most multinationals — had literally dozens of incompatible E-mail systems that had sprung up over the years. Local offices used either host E-mail on their division's DEC VAX (VMS-mail) or IBM AS/400 (Office/400) systems. Others were installing one of the myriad LAN-based packages that were beginning to appear.

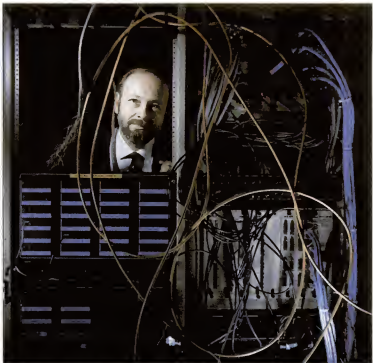
"None of these systems talked well to the others, and it was very difficult to send binary file attachments — such as spreadsheets or other documents — between PC and host E-mail systems," says Shelly Borak, associate director of telecommunications for New York-based Colgate. Although it was new technology at the time, Colgate was beginning to realize how employee productivity would increase if it had a corporatewide messaging system.

SEARCH FOR STANDARDS. For Colgate, what started out as a search for an easier way to send binary files across the network quickly turned into a redefinition of its system architecture. The company discovered that the client/server model of computing was far more appropriate for its business than traditional host-based processing.

Now employees in 165 countries connect to the corporate network, easily exchanging E-mail and files without fear of incompatibilities.

Of course, this change didn't happen overnight. The first step Borak took five years ago was to call in General Electric Information Services Inc. (GEIS) of Rockville, Md., a Value-Added Network (VAN) provider.

Borak faced a conglomeration of E-mail systems and determined that it was better to have a third-party unite



Shelly Borak, associate director of telecommunications at Colgate-Palmolive Co., is moving his corporation away from host-based E-mail.

Colgate's disparate mail environment.

GEIS supplied its X.400-compatible E-mail service, Quik-Comm, rather than building separate mail gateways between multiple Colgate sites around the globe.

Once it was in place, international communications problems were greatly reduced. Fewer employees wasted time playing telephone tag across time zones or using inefficient fax or telex services. The next obvious step was to move off of expensive host E-mail systems. Colgate, like many other firms, realized the high costs associated with processing E-mail on a mainframe. Comparable or better service can be achieved and costs lowered by moving mail processing to PC LANs.

Colgate is in the process of standardizing on Lotus Development Corp.'s ccMail software. Not only was it easy to install and use, but an increasing number of communication gateways and

management features were being added with every release. And it was available for both PCs and Macintoshes, an attractive option at Colgate, where LANs had grown in an ad hoc manner, with a variety of PCs and Macs on users' desks.

ccMail also solved the notorious directory-synchronization problem. With host-based E-mail systems, for example, every time a local E-mail directory changes (an employee "mail-box" is either added or deleted from the system), the change must be manually added to the E-mail directories. ccMail does this automatically among multiple ccMail servers, saving administrative time and headaches.

"With our VAX and AS/400 E-mail systems, we have to manually notify the E-mail administrators at remote sites that a directory has changed," Borak says. "The administrators must then make the changes to their system." It's a major hassle and an important factor in

Colgate's move away from host E-mail. "Our hope is that we get our E-mail off our host systems entirely," Borak says. "It makes sense to let the larger systems do what they do best — application processing — and put E-mail services at regional hubs."

Until that's a reality, Colgate will continue using gateways to connect host E-mail to ccMail sites. Colgate does not have a dedicated mail backbone, but rather relies on GEIS' global presence to service its diverse community.

Colgate plans to eventually implement its own X.400 gateway and perhaps later migrate to an X.400 messaging backbone. It plans to install Santa Monica, Calif.-based Retix Corp.'s OpenServer, which handles messages in multivendor networks connecting to both public and private E-mail services.

"This puts us closer to native X.400 messaging, as opposed to having to rely on an envelope-within-an-envelope approach to messaging services," Borak says.

In the early days, LAN administrators labored tirelessly to cost justify E-mail to upper management. Today, corporate executives such as those at Colgate realize the benefits and don't have to be sold on the idea of E-mail. It sure beats telephone tag and telex, Borak says.

E-MAIL SUPPORT. E-mail administration has also been simplified by this strategy. Colgate has a corporate E-mail facilitator at its New York headquarters who coordinates the global E-mail project. Local E-mail administrators handle implementation and support issues for their users. "We've found that using ccMail has reduced our centralized E-mail support burden," Borak says. "Regional E-mail administrators call or message us when they have a problem, but that's getting less common as we move to LAN-based E-mail."

Borak's office also put together a guidebook that instructs local E-mail administrators on how to set up ccMail. This includes naming and post-office conventions, as well as troubleshooting tips.

"We've had a number of small sites without any prior E-mail experience bring up ccMail using this book," Borak says. Clearly, for Colgate, a decentralized approach to E-mail management is working quite well.

Global E-mail tips

- Replace host E-mail with feature-rich LAN E-mail.
- Adopt an email standard and stick to it. Convert remote sites to corporate standard.
- Maintain version consistency at all locations. Be judicious with updates; some may not be necessary.
- Don't write your own gateways — commercially available ones are easier to maintain and cheaper in the long run.

Colgate reins in its far-flung information systems

Happy with E-mail productivity gains, Colgate is embarking on a project to create an enterprise system architecture spanning hardware, software, and communications subsystems.

Part of the plan involves setting corporate standards. "Five years ago, we let overseas offices buy whatever they wanted," says Shelly Borak, Colgate associate telecommunications director. "Now, we have firm guidelines."

Because Colgate's 7,000-plus desktops include PCs and Macintoshes, Colgate's No. 1 application rule is that software must run on both platforms. The list of standard software includes Microsoft Word, Excel, Lotus ccMail, and Novell NetWare.

Colgate was eager to eliminate quirky, proprietary, and "home-grown" applications that caused file or network com-

patibility problems. "Our goal is to allow all employees to send any file — spreadsheet or database — and have it readable by any other employee," Borak says.

Colgate found it needed to set up an international help desk in its New York office. Foreign subsidiaries can call New York 24 hours a day, seven days a week, if they have communication, network, or application questions. And a certification process tests new applications for compatibility and adherence to corporate standards.

The results: Colgate employees now use the corporate network with increasing frequency. E-mail traffic alone has doubled over the last three years, Borak says. No one expected the use of desktop technology to take off as fast as it has. Today it would be utterly impossible to operate in the global market without such connectivity, Borak says.

Help Desk / Brett Glass



I'm looking for a way that an IBM PC and a Macintosh can share an HP LaserJet IIP. I don't need file sharing in this particular installation, and I'd like to print PostScript output from Windows 3.1 on the IBM. Any ideas?

Rod Morgan

AYou have several options. If you don't already have a PostScript cartridge, the least expensive route is to forget about PostScript and install a driver on your Macintosh that translates its output to the printer's native PCL4 language. I know of four suppliers of such drivers: Insight Development ([800] 825-4115), GDT Softworks ([800] 663-6222), Orange Micro ([714] 779-2772), and Computer Applications ([919] 846-1411). These drivers run from \$100 to \$200. With this software in place, you can use a simple printer buffering and switching device to share the printer.

If you disable LocalTalk, you can use your Mac's printer port for the output, leaving the other Mac serial port free for a modem. Finally, you'll want to use PCL4, not PostScript, when printing from the PC.

If you have HP's PostScript cartridge, you can purchase HP's LaserJet IIP AppleTalk Interface, which lists for \$275. Unfortunately, this will require you to go to the printer's front panel and switch manually between the two computers. Also, because the HP cartridge does not allow you to switch between PCL and PostScript, you will need to make sure that your users never print from DOS on their PCs.

If you're using Version 5.1 or later of the PacificPage PE cartridge from Pacific Data ([619] 552-0880), a good solution is PacificTalk, an adapter that accepts output from any number of Macs on a LocalTalk network and sends it to the printer's parallel port.

You can then connect the PC to the same printer via the serial port. The cartridge itself will switch automatically between PostScript and PCL in case a DOS print job comes in.

Another very flexible solution that works with any cartridge is the Bridge Port, made by Extended Systems Inc. ([800] 235-7576). This device, which lists for \$595, accepts data from any number of Macs (via LocalTalk) and your PC (via a serial or parallel port) and sends output to the printer's parallel port. Unlike the HP Interface, it does not require manual switching.

Because it accepts parallel input, it will let you print more quickly from your PC than the PacificTalk adapter allows. And if you have Version 4.0 or earlier of the PacificPage cartridge, it will add automatic switching between PCL and PostScript.

The final option is to trade in your printer and buy a new one with PostScript and simultaneously active inter-

faces built in. Black-and-white lasers that support this feature are available from several vendors.

QI have a system with a Micronics 486DX2/66 motherboard, an Adaptec SCSI host adapter, and a Chinon 431 CD ROM drive.

When I change the disc in the CD

ROM drive, the drive does not always recognize that a new disc is in the drive. What might be wrong?

Bill Burch

AThe most likely problem is that your ACD ROM's driver software is not tuned for that particular drive and is having trouble detecting a disc change.

Fortunately, your hardware is supported by software from third parties — including Corel's SCSI from Corel Systems ([613] 728-8200) and a kit of CD ROM drivers from Trantor Systems Ltd. ([510] 770-1400), which is soon to be part of Adaptec. If this does not work, you should try sending the drive in for service.

Introducing the slickest, quickest, point-n-click-in-est way to get corporate data. [Any queries?]



It's out there and you know it.

The data you need to do your job is stored somewhere on the network. Sales numbers. Employee reports. Customer lists. Financials. You name it. The problem is getting it.

Of course, you could hassle with a Windows database and develop an entire application to get reports and forms you may use only once.

Or better yet, you could get the new Q+E[®] for Windows[™] version 5. It's the quick, easy way to get all the data you need, when you need it, where you need it, the way you need it.

Access More Than 20 Databases Instantly.

Whether it's in Oracle, dBASE, SQL Server, Paradox, DB2, or just about any other database, Q+E can read it. Instantly. Right



out of the box. Without conversions. Without compromise.

Simply start Q+E, and a couple of mouse clicks later your data pops up in a familiar spreadsheet format. A few mouse clicks more, and you'll have professional-quality reports that look great. On your screen or printer.

The built-in form designer lets you create forms on the fly, and includes powerful Query By Example capabilities that make

it a cinch to find just the facts you want.

There's also a query builder that takes you step by step through the creation of SQL queries. If it's a query you'll want to use again, just save it, or add it to your icon bar and access it with a single mouse click. According to PC Magazine,

"The interactive query builder alone is worth the price; the rest is gravy."
(December 22, 1992)

Put Data To Work In Other Applications.

Need data in a spreadsheet? Want to include it in a

word processing document or graphics application? With Q+E, it's no problem.

Q+E makes it simple to integrate data with your favorite Windows applications. So you get more than data. You get

Oracle	Excel	Teradata
dBASE	INFORMIX	HP ALLBASE/SQL
SQL Server	Northern SQL	IP RANGE/SQL
Sybase	OS/2 DBM	XDB
DB2	Probase	Gateway:
Paradox	SQLBase	IBM DDCS/2
INGRES	SQL-DB	Micro Development
AS/400 (SQL-400)	Text files	Sybase Net Gateway
Retrieve	Tandem NorthStar SQL	

information you can work with any way you want.

Order Q+E Today. Risk Free.

If you're tired of waiting for information, or of not getting information at all, get Q+E version 5 for just \$299. It's the newest release of the only database access program with over 3 million copies in the field.

To order Q+E version 5 for Windows or OS/2 with our 30 day money-back guarantee, call toll-free today. 1-800-876-3101, Ext. E020 8 a.m. to 8 p.m. EST



Brett Glass' Help Desk answers readers' business computing questions. Brett can't answer questions personally. Readers can leave questions by calling (800) 227-8365, Ext. 702 or by messaging CompuServe (72627.3673) or on the Internet at Brett_Glass@InfoWorld.com.

pioneer
SOFTWARE

3540 Centerville Drive, Raleigh, NC 27609 Phone: 919-858-2220 Fax: 919-858-9354 In Europe: P.O. Box 84104, 3008 CA, Rotterdam, The Netherlands Tel: (31) 10 2202 022 Fax: (31) 10 4553 348 ©1992 Pioneer Software Inc. All company and product names are trademarks or registered trademarks of their respective owners.

New Age IS / Cheryl Currid

Some little secrets about my left-brained page partner



Well, well, well. Look who's here, *InfoWorld's* newest face, David Strom. This week, my longtime colleague and original publishing sponsor joins the illustrious ranks of *InfoWorld* columnists in the Enterprise Computing section. Let me be a first to join the editors and offer him a warm and sincere welcome.

With pleasantries done, I'll also tell you some dirty little secrets about David Strom.

As Strom recounts in his column, we go way back. The truth is, he is the reason I began expressing my views in print. He was the first editor to pull me out of my quiet and cushy corporate America chair and encourage me to start writing about the trials and tribulations of life as a computing change agent. (So if you don't like my ideas, thoughts, or writing, you can blame him. I certainly do.)

Over the years, we've stayed in touch as time and technology have changed the world.

Quite recently, Strom and I have been collaborating on a couple of projects, looking at new technologies that are likely to shake up things even more.

In some ways, Strom and I are a good team—a left brain and a right one. Put us together and you've got a whole-brain approach to technology.

We see things with very different sets of eyes—he with a "guilty until proven

innocent" attitude, and I with a "hope springs eternal" view.

Occasionally we get our opinions into alignment. This only occurs with select positioning of the sun, moon, and stars, and the introduction of killer technology. When it does happen you can bank on a winner.

Strom's new column, *The Network Curmudgeon*, couldn't be more aptly named. He is no Pollyanna pushover. He

We see things with very different sets of eyes—he with a "guilty until proven innocent" attitude, and I with a "hope springs eternal" view.

doesn't trust anything or anyone when it comes to technology. I've seen him rip through complex technology combinations, leaving behind a landfill's worth of cartons, static-free wrappers, and manuals.

Once he gets things installed, he tries every bloody combination and permutation to break it. His basic methodology: leave no stone unturned and no parameter untried.

You ought to see him at a trade show. I've watched him walk around the dis-

plays making sure all the wires were connected as advertised. That tactic strikes terror in the hearts of the salespeople. He knows the right buttons to push and the right questions to ask. And woe to the vendor who gets anything wrong—Strom will pursue him or her relentlessly until the vendor fixes the problem. He's not good at taking "no" for an answer.

Strom has a pretty good track record for picking technology. He's been right

He was an ardent devotee of ccMail while my heart remained with the Higgins E-mail package. On a features basis, I still think I was right, but the market proved him to be the winner.

So much for the good old days. Strom and I have recently found ourselves somewhat out in left field with technology. Lately we have both been traveling with a wireless E-mail setup (an Ericsson/GE Mobidem) and transmitting messages over the airwaves using RadioMail.

We've exchanged messages and communicated from such unusual places as taxicabs in different cities, moving sidewalks in airports, and restaurant tables on different sides of the country.

That gives us a unique opportunity to pass bits of information about the comings and goings of this crazy information technology industry—and the effects the technology has on you, the corporate computing professional.

So let me chime in on his challenge. If you have any favorite technology axes to grind, let us know.

If you'll share your concerns with us, we'll beam up messages to each other and bounce back with a set of opinions in our respective columns. Go ahead, put us to the test.

Cheryl Currid, president of Houston-based Currid & Co., focuses on helping clients assess, apply, and organize for new information technology. Her CompuServe address is: 73300.2660.



The Network Curmudgeon / David Strom

I'm not only left-brained, but I'm a hands-on curmudgeon

First columns are a lot like first dates: You approach your potential audience awkwardly, slowly, not sure of how you should present yourself, checking your outfit in the mirror, wondering if this is the right match.

Well, I hope we hit it off and have a successful relationship. I'm excited about writing for *InfoWorld* and am looking forward to hearing what you have to say as well.

So what is this column all about? First off, I will focus more on networking topics than not. Unlike many other professional pundits, I try to actually touch the products that I write about and actually use them to run my business.

This can get me into trouble sometimes, such as the time I tried to take a beta version of a PCMCIA modem on a trip to California, or bring up a new server the day before I had to have it ready for a client. You'll be hearing about these and other episodes in coming columns.

My particular bent is to look at how computing in the enterprise really happens and which products work in which particular environments. I intend to have some fun, hopefully at my own expense, and produce something that you'll enjoy reading. If not, I hope you call me on it.

For those of you who don't know me, some background.

I recently started my own consulting firm that works with a variety of comput-

er vendors to help them make better hardware and software products through a combination of marketing and technical programs.

I promise that if I am writing about a client's product I'll be straight with you and tell you.

For the last six years, I've been a computer trade journalist, most recently as editor-in-chief of *Network Computing*, which I helped launch. Before that I

back when networks were Systems Network Architecture, computers were 8088s, DOS was just Version 2.0, and Apple just had the Lisa. One of those jobs was working in the Information Center (back then, we capitalized it) for Transamerica Occidental Life Insurance Company, in Los Angeles, and another was at a similar position for the U.S. Department of Agriculture, in Washington.

At Transamerica I helped to set up the

put together both Ethernet and Token Ring networks and am not religious about either (unlike our publisher); my office currently has a piece of Erickson's Ethernet running around the walls because it was the easiest thing for me to install.

I ran my last magazine on Microsoft's E-mail but used just about everyone else's at some time or another. Right now I am using MCI Mail and the Internet through the courtesy of Ericsson's Mobidem (a client, and the best way that Cheryl Currid and I communicate with each other).

I've also spent lots of time in front of Focus and Oracle databases and front ends of various pedigrees.

You may wonder how I can get access to these sorts of resources to continue work with complex networks. Well, I don't intend to duplicate the types of labs in my own office that we have at *InfoWorld* or at other publications.

Instead, I intend to call your aid. I'll come visit your site, install some new product on your own network (in a controlled enough environment that your production users aren't affected adversely, I hope), and report on the results. If you are interested in volunteering, let me know.

David Strom is president of his own consulting firm, in Port Washington, N.Y. He can be reached via MCI Mail at dstrom/3193660 or via the Internet at dstrom@radmail.net.

My particular bent is to look at how computing in the enterprise really happens and which products work in which particular environments. I intend to have some fun, hopefully at my own expense.

wrote for *PC Week's* Connectivity section.

As a journalist, I've written hundreds of articles, reviews, and columns on networking topics. And I helped give both Cheryl Currid (as the more or less accurate stated in her column this week) and Bob Metcalfe (I was his first editor, and he'll never let me live it down that I am working for him here) their starts in the trade journalism business.

Before my stint in journalism, I held numerous jobs in end-user computing,

company's first NetWare network and recommend communication products. That started my interest, and since then I have been hooked on the topic.

Besides NetWare, I've used Vines, LAN Server, LAN Manager, and Unix, in order of decreasing familiarity. I spend most of my time these days using Windows and the Macintosh.

I did use OS/2 a long, long time ago, back in the days when Steve Balmer thought enough of it to say it would become a million-seller for Microsoft. I've

INFO WORLD REPRINT

The Executive Forum Reports into Are

By Louise Pines

Executive Forum, the new executive information system (EIS) introduced last week by IMAS Inc., adds to standard EIS capabilities by letting executives look at reports as well as numbers generated by coworkers.

A traditional EIS pulls data out of an organization and moves it in one direction to the senior executive, said Stuart Wooding, director of software strategy research at Forrester Research. Executive Forum will complete the feedback loop, Wooding said.

Jointly developed with Development, Executive Forum,

GOOD NEWS BEARS REPEATING

InfoWorld publishes the most respected product features, reviews, and comparisons in the personal computer and networking press.

That's why *InfoWorld* Reprints are powerful, prestigious, and credible. In addition to being very economical.

So when *InfoWorld* covers your product, spread the word. With *InfoWorld* Reprints.

For a fast, free quote, call Ellen Markoff at 800 227-8365.

INFO WORLD



INFO WORLD REPRINT

Compaq Pares D

Single-processor 486SX/25 handles...
Compaq's Compaq's System...
Single-processor 486SX/25 handles...
Compaq's Compaq's System...
Single-processor 486SX/25 handles...
Compaq's Compaq's System...

INFO WORLD REPRINT

Microdyne Sh

Promises better remote...
Microdyne Corp. is shipping...
ready-to-use dial-in/dis...
t communications serv...
for NetWare, promising to make...
remote communications easier and...
more reliable.

INFO WORLD REPRINT

Script interpreter le

turns Xerox 5775 in...
Under a OEM agreement...
Alexandria, Virginia-based Micro...
dyne will combine Novell's Net...
Ware Access Server and Asym...
chronous Communications Server...
(NACS) software with an integrat...
ed, preconfigured hardware plat...
form designed for remote commu...
nications.

INFO WORLD REPRINT

Microsoft's Fox Purchase

Stirs up the XBase Mark...
By Lisa Poole and Scott Rice...
SAN FRANCISCO — Personal...
computer software giant Microso...
ft has purchased the XBase mark...
eting rights of Fox Software, a...
company that has been a leader in...
the XBase market for years. The...
acquisition, which is a key part...
of Microsoft's strategy to build...
out its database software line...

INFO WORLD REPRINT

Wins Big

Another face in the crowd...
By Lisa Poole and Scott Rice...
SAN FRANCISCO — Personal...
computer software giant Microso...
ft has purchased the XBase mark...
eting rights of Fox Software, a...
company that has been a leader in...
the XBase market for years. The...
acquisition, which is a key part...
of Microsoft's strategy to build...
out its database software line...

INFO WORLD REPRINT

Remote Control Software: Nor

ton's pcAnywhere was a stellar performer in the...
By Lisa Poole and Scott Rice...
SAN FRANCISCO — Personal...
computer software giant Microso...
ft has purchased the XBase mark...
eting rights of Fox Software, a...
company that has been a leader in...
the XBase market for years. The...
acquisition, which is a key part...
of Microsoft's strategy to build...
out its database software line...

INFO WORLD REPRINT

Norton Back-up Software Rates High Score

Text and Text Development by Tom Diley Review Board. Edited by Carla Mathews Associate Reviewers...
By Lisa Poole and Scott Rice...
SAN FRANCISCO — Personal...
computer software giant Microso...
ft has purchased the XBase mark...
eting rights of Fox Software, a...
company that has been a leader in...
the XBase market for years. The...
acquisition, which is a key part...
of Microsoft's strategy to build...
out its database software line...

INFO WORLD REPRINT

A Leadership Rol

By Alice LaPointe...
NCR's Williamson says IS...
Microsoft chairman Bill Gates...
merger.

INFO WORLD REPRINT

16DX PCs

Report Card...
DataStar 486/50...
Microsoft chairman Bill Gates...
merger.

INFO WORLD REPRINT

Report Card

DataStar 486/50...
Microsoft chairman Bill Gates...
merger.



Base Camp



The Ascent



Reaching The Summit



intel
inside

Going to Extremes

If you want to know what the Gateway 2000 Nomad notebook PC can endure, just ask mountaineer Wally Berg. He took the Nomad 425DXL with him last fall on an expedition to the highest point on earth — the majestic, 29,128-foot Mount Everest in the Himalayan Mountains of Nepal.

Wally used the Nomad daily to track supplies, budget, and events of the climb. "Despite being transported over rugged terrain by yak, and operating in an unheated tent with temperatures outside of 20 to 30 degrees below zero, the Nomad performed flawlessly," said Wally. "The size was perfect, too. We had so many supplies to carry that size and weight were a big consideration."

Wally powered the Nomad with three sets of NiCad batteries which he recharged with a solar panel. Wally said the batteries weren't affected by the frigid temperatures. Each battery always lasted up to six hours.

The expedition left for its final climb to the Everest summit shortly after midnight on October 9. They ascended toward the peak by moonlight, reaching the top at 8 a.m. "It was a feeling of total exhilaration to finally reach the highest point in the world," said Wally.

Even if you don't plan to take your Nomad to Mount Everest, it makes the perfect traveling companion wherever you journey. The Nomad weighs just 5.6 pounds and measures 8.5 x 11 x 1.8 inches. Standard features include: a 25MHz Intel® 486SX or 486DX processor; 4MB RAM; an 80MB hard drive (425SXL model) or a 120MB hard drive (425DXL model); a 3.5-inch diskette drive; a 10-inch backlit VGA screen; a comfortable 79-key keyboard and FieldMouse® portable pointing device; MS-DOS,® Windows™ and Works for Windows.® Perhaps the most attractive feature is the price:

Nomad 425SXL ■ \$1995

Nomad 425DXL ■ \$2695

A Nomad gives you portability, 486 desktop performance, a great screen and keyboard, outstanding battery life — plus incredible durability. So take it from Wally Berg. If the Gateway Nomad can endure an Everest expedition, it can take almost anything!



8 0 0 - 5 2 3 - 2 0 0 0

610 Gateway Drive • P.O. Box 2000 • North Sioux City, SD 57049-2000
605-232-2000 • Fax 605-232-2023

REVIEWS / PRODUCT COMPARISON

Intel-alternative desktop computers

Comparison shopping for non-Intel chips can result in price/performance bargain

INTRODUCTION BY PEGGY WALLACE
REVIEW BOARDTESTED BY EARL ANGUS,
ANDREAS UTERWIK
AND TIM ZITTE TECHNICAL ANALYSTSTESTS DEVELOPED BY DAVID WALKER
TEST DEVELOPMENT SPECIALISTEDITED BY SHOBHAN NASH
ASSOCIATE REVIEWS EDITOR

When you go shopping for PCs these days, you're as likely to find 386 and 486 machines with processors from Advanced Micro Devices Inc., Cyrix Inc., and even IBM as you are to discover Intel inside. Although variety is always welcome, alternatives to a well-known standard-bearer always raise questions: Do these chips offer any notable improvements over Intel's? Will they increase competition and lower prices?

This group of Intel-alternative processors has also created a little confusion. Instead of being copycat chips, they differ enough from Intel's microprocessors to make you wonder what class of processor they belong to.

To answer these questions and alleviate the confusion, we've tested six desktop computers, each incorporating an alternative CPU: Austin 486/SLC-33 WinStation (Cyrix 486SLC/33); CompuAdd 433DLC (Cyrix 486DLC/33); IBM PS/2 56 486SLC2 (IBM SLC/25-50); Micro Express ME 486DLC/40 (Cyrix 486DLC/40); PC Brand Leader 486SLC/25 (Cyrix 486SLC/25); and Polywell Poly 386-40R (AMD 386DX/40).

Although these are disparate processors, we have compared their speed, features, and price as a group. Users are looking into buying these non-Intel computers because they want more for their money. Price, in this case, is the primary concern. Because of this, we have made price a weighted category (see *How we test*, page 49), equally weighted with speed, and this will be reflected in the products' final scores.

To give you an idea how these alternative processors measure up to the Intel family of chips, we've compared this group of computers against Compaq and Dell systems incorporating various Intel microprocessors — 386SX/25, 386SX/33, 386DX/33, 486SX/25, 486SX/33, and 486DX/250. In cases where we had an average SYSmark/92 at a particular CPU class, we used those rates.

CHIP OFF THE BLOCK. Of the alternative processors, the Cyrix chips are the most confusing to classify, particularly the 486SLC. As its moniker suggests, the 486SLC uses the 486SX instruction set, as does the Cyrix 486DLC series. But unlike the DLC and Intel's 486SX chips, which have both 32-bit internal and external



data paths, the SLC has the 16-bit data path of a 386SX.

And whereas other 486SXes have an 8K cache, the SLC and the DLC feature a 1K cache. Both Cyrix chips also have a built-in integer hardware multiplier (a substitute for the math coprocessor found on Intel's 486s), which speeds up some math calculations, primarily video instructions. Intel's 486SXes, on the other hand, have no FPU at all. So just what kind of chips are the 486SLC and DLC? According to Cyrix, the silicon inside

the 486SLC and 486DLC makes them 486s because of their instruction sets and the software they can run. Still, due to its 16-bit data path, some PC pundits refuse to view the SLC in the 486 category, and Cyrix concedes that the SLC is best classified as a 386SX rival.

This matches our test results. In SYSmark/92 testing, both the 25- and 33-MHz SLC processors outperformed Intel's 386SX chips running at the same speed. The 486SLC/33 even outperformed our 386DX/33. However, machines with the

AMD 386/40 and Intel 486SX/25 easily outpaced the Cyrix SLC chips. This fuels the arguments that these processors are comparable to the 386 family, not the 486SX.

Cyrix's 486DLC/33 is also difficult to fit into a category. According to the manufacturer, this processor competes with Intel's 486SX. However, the CompuAdd with a 486DLC/33 chip was slower than either our Compaq 486SX/25 or our Dell 486SX/33.

The 40-MHz version of Cyrix's 486DLC chip was the only one to perform like a true 486. The 486DLC/40 was negligibly slower than our average Intel 486DX/33 (see product comparison, October 19, 1992, page 66).

IBM's 486SLC/25-50 clock-doubling chip uses the 486SX instruction set and 32-bit internal data path but only a 16-bit external data path. At 16K, the IBM SLC2's cache is double that of Intel's 486SX processor, but there is no math coprocessor and no Cyrix-like substitute. Although IBM's clock-doubling chip runs internally at 50 MHz, it performs more closely to a 486SX/25.

The AMD 386DX/40 microprocessor is the most conventional of the alternative chips we looked at, with the same 32-bit internal and external data paths as Intel's 386DX entries. The 386/40 was the industry's first 40-MHz 386 chip. It was created to bridge the gap between 386s and 486s, which it clearly does in our tests.

Among alternative processors, the AMD 386/40 appears to have carved out the strongest identity, both in performance and in price. According to analysts, the AMD chip has completely changed the 386 arena, with AMD owning 50 to 75 percent of this market. Intel, instead, is focusing its energies completely on its 486 families.

Although Cyrix's processors will also exert pressure on Intel's pricing, the price vs. performance for 486SLC and DLC chips is somewhat confused, at least among the PCs we evaluated. For example, the speedier Micro Express (Cyrix 486DLC/40) costs \$1,799, which is less than the slower \$1,938 PC Brand (Cyrix 486SLC/25) and the \$2,037 CompuAdd (Cyrix 486DLC/25).

If you're in the market for a lower end computer, machines incorporating CPUs from AMD, Cyrix, and IBM are worth a look. These systems provide reasonable performance at inexpensive prices. However, they don't have the CPU upgradability that Intel systems offer.

Peggy Wallace is a San Francisco-based writer specializing in PC issues.

More weight put on price, expandability in testing Intel-alternative desktops

In order to fairly and effectively judge this group of desktops incorporating several non-Intel CPUs, we dramatically changed the category weightings and scoring methods to reflect buyers' primary concern—price vs. speed. We also altered the weight and scoring method for expandability.

We evaluated this group of desktop computers using tests designed to evaluate performance and feature differences among popular PC compatibles. The benchmark test, SYSMark92, was developed by the Business Application Performance Corp. (BAPCO)—a consortium of hardware and software manufacturers, as well as magazines and testing facilities, including *InfoWorld*. (For details, see product comparison of 486DX/50 PCs, June 29, 1992, page 58.) All tests are designed to imitate the tasks users run in real-world environments.

PERFORMANCE:

As with previous comparisons, we scored speed for these Intel-alternative PCs as a group, although they represent different CPU classes. However, instead of assigning scores according to the spread in performance and how the systems cluster, we scored speed math-



ematically. The fastest systems for both speed categories received the maximum points possible. SYSMark92 (175) and multitasking (35). All other units got a percentage of the maximum points based on dividing their SYSMark92 and multitasking results by the fastest times in the category.

Speed—SYSMark92: This benchmark measures the performance of 11 popular business applications. The elapsed times of these applications are combined to produce the SYSMark92. This score is a rate (work divided by time), so higher numbers indicate better performance.

The test suite is broken down into application categories:

Database: The dBase IV 1.1 script creates several tables for a typical retail-order customers-ZIP code database. The script then steps through a series of queries, displaying some while redirecting others to files. The Paradox 3.5 script posts several hundred debit and credit transactions, as well as a variety of

queries, data validation, and reports.

Desktop graphics: Harvard Graphics 3.0 for DOS creates a presentation containing charts generated manually as well as from WK1, Excel, and ASCII files. After formatting the charts, slides are prepared for output to devices, including plotters.

Desktop publishing: The PageMaker 4.0 test produces two documents—a two-page newsletter with text, a table, and graphics; and a ledger-size poster. The script uses such features as formatting, spell-checking, hyphenation, tracking, and printing.

Software development: The Borland C++ 2.0 test builds 10 object-oriented applications or Dynamic Link Libraries from sources using various memory models. Similarly, the Microsoft C 6.0 test builds three applications from source.

Spreadsheet: The Excel 3.0 work load includes several spreadsheets, including a mathematical worksheet, a break-even analysis, a text form, and several tax forms. Lotus 1-2-3 3.1+ creates an amortization table that includes cost-tracking features, then loads a company budget and builds several charts.

The Quattro Pro 3.0 script works with four principal applications: a company-wide budget consolidation, analysis of

major customer accounts from a database, forecasting several plant-consolidation options, and a small text table. The spreadsheet scripts exercise such features as copying cells, editing formulas, and printing.

Word processing: The Word for Windows 2.0 test uses several short documents and one large document. The script uses ASCII file conversions, formatting, spell-checking, mail merge, placing graphics, printing, and print-previewing. In WordPerfect 5.1 for DOS, the script formats and print-previews a 10-page document, creates a smaller document with multiple columns and a graphic, and finally creates a simple one-page memo.

Speed—multitasking: To evaluate multitasking speed, we measured the time to complete three simultaneous tasks under Windows 3.0. We used Microsoft Excel, Version 2.1c; Ami Pro, Version 1.2; and Micrograph Designer, Version 3.01.

Compatibility: To test software compatibility, we ran the following applications: Borland C++ 2.0, Desqview 2.4, Excel 3.0a, Harvard Graphics 3.0, LAN Manager 2.1, Lotus 1-2-3 3.1, Microsoft C 6.0, Microsoft DOS 5.0, Novell Net-

See **HOW WE TEST**, page 51

Executive summary

The introduction of microprocessors from vendors such as AMD, Cyrix, and IBM has broadened the CPU market and given users more choices. But at the same time it has added confusion. Just because a chip bears the 486 name doesn't mean it offers the kind of performance you've come to expect from a 486, as established by the Intel family of 486 processors. Cyrix's 486SLC series, for example, runs more like a 386SX.

Performance is always a premium asset, and users want more bang for their buck, which is why there is a market for machines with non-Intel CPUs. Price is also a major consideration—equal to performance—when buying these processors, because there is little differentiation of features. That's why in this comparison, where we've rounded up six PCs covering the range of available Intel-alternative processors, we've altered our category weightings and scoring methods for speed, expandability, and price, and judged them as a means to reflect the common concerns in the marketplace.

THE RESULTS. The Polywell Poly 386-40R ranked highest among the Intel alternatives we evaluated. With the AMD 40-MHz 386DX processor, this system performed significantly faster than our 386DX/33 on SYSMark92 by 47 percent; the Poly was 9 percent slower than our 486SX/25. Performance in multitasking tests was similar. The Polywell also comes at the very inexpensive price of \$1,013. Overall, this system is a fine machine, offering average expandability, for its small-foot-

print case design, and documentation. Polywell excels in support policies, providing five-year labor, two-year motherboard, and one-year parts warranties. Although there is a toll-free line, it is only for calls outside California.

The Micro Express ME 486DLC/40 posted the fastest speed results among these Intel alternatives. It is the only Cyrix chip to rival the performance of an Intel 486 processor, with the closest counterpart being a 486DX/33. The Micro Express was just 1 percent slower than our average 486/33 in SYSMark92. The ME 486DLC/40 comes at a midrange price—\$1,799. It offered the greatest expandability, therefore earning the maximum number of points, with four drive bays and five slots open after configuration and support for 32 megabytes of RAM. Micro Express also provides top-notch support, including a two-year warranty, a 60-day money-back guarantee, and 24-hour, seven-day-a-week technical support. We did encounter one compatibility problem: We had to add HIMEM.SYS to Borland C++ to run SYSMark92.

The CompuAdd 433DLC, with a Cyrix 486DLC/33 processor, proved a middling performer. It is a hard CPU to categorize: 16 megabytes maximum RAM and one of a 486SX/25 and 386DX/33, at 15 percent slower and 36 percent faster, respectively. The 433 carries the second lowest price tag—\$1,528, which is still \$500 more than the Polywell. We found it was an average machine overall, whose design, performance, and technical information, and there were several jumpers on the motherboard.

The IBM PS/2 56 486SLC/25 was next in line. The fact that this machine touts a 25/50-MHz clock-doubling CPU is a bit deceiving. Unlike Intel's 486DX/25, which runs internally and externally on a 32-bit data path, the IBM processor runs

THE SCORES	
Polywell Poly 386-40R	8.6
Micro Express ME 486DLC/40	8.2
CompuAdd 433DLC	7.2
IBM PS/2 56 486SLC/25	7.1
Austin 486/SXC-33 WinStation	6.7
PC Brand Leader 486SLC/25	5.9

on a 32-bit internal and a 16-bit external data path. Its performance most closely compares with that of a 486SX/25, with a negligible speed difference. Although a bit faster than the Polywell, the PS/2 56 was a fair bit more, at \$1,991 street price.

We experienced incompatibilities between the XGA Drivers, Version 2.0, and Windows Object Linking and Embedding features. (IBM should have a fix available by our publication date.) The PS/2 56 provided the least expandability, with 16 megabytes maximum RAM and three slots and one drive bay open after configuration. This system excelled in documentation, providing a plethora of information in an easy-to-read format, and setup. The vendor also provides outstanding support, with a three-year warranty and free on-site service, as well as 24-hour, seven-day-a-week technical support.

The Austin 486/SXC-33 WinStation outperformed both the 386SX/33 and 386DX/33 systems by 48 percent and 6 percent, respectively. It was 34 percent slower than our 486SX/25. The WinStation is the second most expensive ma-




chine of the ones reviewed here (\$1,890). In compatibility, we had difficulty configuring a couple of the cards; some would not work in certain memory addresses. We found the WinStation to have fine documentation and setup and above-average workmanship.

The PC Brand Leader 486SLC/25 brings up the rear in this comparison. This unit posted the slowest benchmarks of the machines we reviewed. Comparable to a 386SX, the Leader came out ahead of our 386SX/25 and 386SX/33 times by 20 percent and 13 percent, respectively. However, the Leader was 22 percent slower than a 386DX/33 and 49 percent slower than a 486SX/25. Against the Austin 486SLC/33, the PC Brand was 22 percent slower, and at \$1,845, it comes at a price just \$45 less than the Austin.

We were disappointed with the PC Brand's system design. Slimline cases don't afford much space to begin with, and this one wasn't used efficiently. In addition, traces from full-length cards resting on the memory could cause a short. Support policies, however, were top-notch.

REPORT CARD

Intel-alternative desktop computers

		Austin 486/SLC-33 WinStation 	CompuAdd 433DLC 	IBM PS/2 56 486SLC2 
	(InfoWorld weighting)			
SYSmark92	(175)	67.10; 36 percent slower than average 486DX/33. Points: 112	86.65; 17 percent slower than average 486DX/33. Points: 145	100.98; 4 percent slower than average 486DX/33. Points: 169
Multitasking	(35)	02:10; 60 percent slower than average 486DX/33. Points: 22	01:44; 22 percent slower than average 486DX/33. Points: 27	01:33; 12 percent slower than average 486DX/33. Points: 30
Compatibility	(100)	Difficulty configuring cards, some would not work in certain memory addresses; IDE controller card had to be set to DC00 h. Very Good	No problems encountered. Excellent	Unable to disable integrated SCSI interface; incompatibilities with XGA drivers, Version 2.0 and Windows' OLE features. Very Good
Expandability	(210)	Two drive bays, four slots open after configuration; supports 16 megabytes of 32-bit system RAM. Points: 156	One drive bay, five slots open after configuration; supports 32 megabytes of 32-bit system RAM. Points: 123	One drive bay, three slots open after configuration; supports 16 megabytes of 32-bit system RAM. Points: 91
Documentation	(50)	Collection of OEM manuals; user's manual and technical reference useful for novices, describing features and peripherals; detailed illustrations, tables; adequate glossary but no index; appendix included; sparse troubleshooting guide needs improvement. Good	Manuals included users' guide, Read Me First (setup guide), DOS, and Windows; detailed index, table of contents; top-notch illustrations; easy to read; fine troubleshooting section; setup guide helps with quick, easy setup; missing some information on jumpers; documentation covers series of systems, not individual unit. Good	Manuals include installing options, setup, Micro Channel computer reference, users' handbook, XGA device drivers installation instructions, solving problems, and OS/2 2.0; well-organized, easy-to-read layout; table of contents, appendix, and index, but no glossary; detailed, thorough information throughout. Excellent
Setup	(70)	DOS 5.0, Windows 3.1 pre-installed; mouse included; SIMM sockets easily accessible; ROM-based setup; LEDs for power and hard drive access; reset button on front panel; power switch located at back of system; no case lock; password security feature via setup. Good	DOS 5.0, Windows 3.1 pre-installed; memory sockets, coprocessor, and drive bays easily accessible; expansion cards fit well; several jumpers on motherboard; LEDs for power and hard drive access; no reset button; ROM-based setup; no case lock; password via setup. Good	OS/2 2.0 pre-installed; no reference disk, but setup accessible via Ctrl-Alt-Ins; SIMM sockets easily accessible; BIOS upgraded via floppy disk; LEDs for power, hard drive access; power switch on front panel; case lock, password option via setup. Excellent
System design	(50)	Small AT-style case; well designed; neat layout; no patches on motherboard. Very Good	Small-footprint case; single backplane-board divides left third of system, with three slots lined up to the left and two slots to the right; no patches on motherboard. Very Good	Slimline case; well constructed, solid; safety feature cuts off power to power supply when cover removed, with a switch to manually override this; no patches on motherboard. Very Good
Support policies	(50)	One-year warranty; free on-site service; 30-day money-back guarantee; toll-free line; BBS, fax support; extended hours. Excellent	One-year warranty; 30-day money-back guarantee; toll-free line; BBS, fax support; extended hours. Excellent	Three-year warranty; free on-site service; 30-day money-back guarantee; toll-free line; BBS, fax support; extended hours. Excellent
Technical support	(50)	Based on our calls. Good	Based on reader survey. Good	Based on reader survey. Good
Price	(210)	\$1,890 street price for our configuration; sold through direct sales. Points: 112	\$1,528 street price; \$2,037 list price for our configuration; sold through direct sales and dealer channels. Points: 139	\$1,991 street price; \$2,655 list price for our configuration; sold through dealer channels. Points: 106
Final score		6.7	7.3	7.1

GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions.

Points for speed, expandability, and price are derived mathematically, with the highest-standing system in each category receiving the maximum points possible. All other units received a percentage of the maximum points based on standing in the ranks.

Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

Excellent = 1.0 — Outstanding in all areas.
Very Good = 0.75 — Meets all essential criteria and offers significant advantages.

Good = 0.625 — Meets essential criteria and includes some special features.

Satisfactory = 0.5 — Meets essential criteria.

Poor = 0.25 — Falls short in essential areas.

Unacceptable or **N/A** = 0.0 — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little.



Company: Austin Computer Systems Inc., in Austin, Texas, can be reached at (800) 752-1577 or (512) 339-3500; fax: (512) 454-1357.

Test configuration: Enhanced keyboard; STB PowerGraph X-24 Super VGA card; 200-megabyte Western Digital hard disk with IDE 1:1 controller; 5¼- and 3½-inch floppy drives; 8 megabytes of 70-nanosecond RAM.



Company: CompuAdd Corp., in Austin, Texas, can be reached at (800) 627-1967; fax: (512) 331-6236.

Test configuration: Enhanced keyboard; built-in local bus VGA with 1 megabyte of RAM; 220-megabyte Western Digital hard disk with 1:1 IDE controller; 5¼- and 3½-inch combination floppy drive; 8 megabytes of 70-nanosecond RAM.



Company: IBM Personal Computer Co., in Somers, N.Y., can be reached at (800) 772-2227; fax: (800) 426-4329.

Test configuration: Enhanced keyboard; XGA-2 integrated video with 1 megabyte of RAM; 212-megabyte hard drive; 3½-inch floppy drive; 8 megabytes of 70-nanosecond RAM.

Micro Express ME 486DLC40



104.25; 1 percent slower than average
486DX/33. **Points: 175**

01:22; 1 percent slower than average
486DX/33. **Points: 35**

Required us to add HIMEM.SYS to
Borland C++ to run SYSMARK92.

Very Good

Four drive bays, five slots free after configuration; supports 32 megabytes maximum of 32-bit system RAM. **Points: 210**

Users' guide and DOS, Windows manuals; OEM manuals for graphics card and IDE caching controller card; instructions for I/O card and changing jumper settings included; table of contents, index, and glossary included; useful illustrations; clear explanations; documentation improved from previous releases.

Good

DOS 5.0, Windows 3.1 pre-installed; system came ready to run; ROM-based setup; easy to reconfigure; SIMM sockets easily accessible; LEDs for power, turbo, and hard drive access; power button, turbo button, and key lock on front panel.

Very Good

Minimal case size; clean slot layout; no patches on motherboard.

Very Good

Two-year warranty; 60-day money-back guarantee; toll-free line; extended hours.

Excellent

Based on our calls. **Very Good**

\$1,799 list price for our configuration; sold through direct sales. **Points: 118**

8.2



Company: Micro Express, in Santa Ana, Calif., can be reached at (800) 989-9900 or (714) 852-1400; fax: (714) 852-1225.

Test configuration: Enhanced keyboard; ATI Ultra graphics card with 1 megabyte of RAM; 200-megabyte Western Digital hard drive with IDE 1:1 controller; 5¼- and 3½-inch floppy drives; 8 megabytes of 70-nanosecond RAM.

PC Brand Leader 486SLC/25

51.81; 50 percent slower than average
486DX/33. **Points: 96**

02:54; 53 percent slower than average
486DX/33. **Points: 16**

No problems encountered.

Excellent

Two drive bays, two slots open after configuration; supports 16 megabytes of 32-bit system RAM. **Points: 102**

Users' guide and DOS, Windows, and Microsoft Works manuals included; contains most required information; needs more detail; novices may find some information confusing; manual covers entire series of systems; adequate table of contents, index.

Satisfactory

DOS 5.0, Windows 3.1, Microsoft Works pre-installed; few jumpers; SIMM sockets easily accessible on motherboard; ROM-based setup; slots easily accessible on backplane board; power switch and recessed reset and turbo buttons on front panel; LEDs for power, hard drive access, and turbo. **Good**

Stimline case; inefficient use of space; full-length card traces resting on memory could cause a short; workmanship needs improvement; several patches on motherboard. **Satisfactory**

One-year warranty; free on-site service; 30-day money-back guarantee; toll-free line; BBS, fax support; extended hours.

Excellent

Based on reader survey. **Good**

\$1,845 list price for our configuration; sold through direct sales. **Points: 115**

5.9



Company: PC Brand Inc., in Moorpark, Calif., can be reached at (800) 722-7263; fax: (805) 378-7801.

Test configuration: Enhanced keyboard; Orchid ProDesigner II VGA card, 1 megabyte of RAM; 250-megabyte Seagate hard drive with IDE 1:1 controller; 3½-inch floppy drive; 10 megabytes (8 megabytes not available) of 70-nanosecond RAM.

Polywell Poly 386-40R



93.46; 11 percent slower than average
486DX/33. **Points: 156**

01:54; 28 percent slower than average
486DX/33. **Points: 25**

No problems encountered.

Excellent

Two drive bays, five slots open after configuration; supports 32 megabytes of 32-bit system RAM. **Points: 178**

Users' guide includes table of contents, detailed index, and sketchy glossary; sparse troubleshooting section but support numbers included; OEM manuals for I/O card, Fahrenheit 1280 video card, IDE caching controller, DOS, and Windows.

Good

DOS 5.0 pre-installed; Windows 3.1 included; ROM-based setup; system cache sockets, slots, and coprocessor sockets easily accessible; power, reset, and turbo buttons on front panel; LEDs for power, turbo, and hard drive access.

Small-footprint case; clean layout; minimal obstructions; must unplug drive cables to install memory; no patches on motherboard. **Very Good**

Five-year labor, two-year motherboard, and one-year parts warranties; 30-day money-back guarantee; toll-free line outside Calif.; fax support; extended hours. **Excellent**

Based on our calls. **Very Good**

\$1,013 street price; **\$1,350** list price for our configuration; sold through direct sales and dealer channels. **Points: 210**

8.7



Company: Polywell Computers, in South San Francisco, Calif., can be reached at (800) 999-1278 or (415) 583-7222; fax: (415) 583-1974.

Test configuration: Enhanced keyboard; Orchid Fahrenheit 1280 Super VGA card with 1 megabyte of RAM; 200-megabyte Maxtor hard drive with IDE 1:1 controller; 5¼- and 3½-inch floppy drives; 4 megabytes of 60-nanosecond RAM.

HOW WE TEST from page 49

Intel-alternative desktop computers

Ware 3.11, OS/2 2.0, PageMaker 4.0, QEMM 6.02, Quattro Pro 3.01, Windows 3.0a and 3.1, Word for Windows 2.0, and WordPerfect 5.1.

To test hardware compatibility, we installed and tested an Adaptec SCSI host adapter, Hewlett-Packard ScanJet IIP scanner and card, IBM Token Ring adapter, Intel Satisfaction fax/modem, Orchid S3 video board (ISA and EISA), Matrox TIGA board (MCA), and 3Com Ethernet adapter.

Systems that ran our test suite, both hardware and software, flawlessly out of the box received excellent scores. For each major change (e.g., changing more than one card, interrupt, or I/O address), we deducted one-half point. We subtract a full point for each software package or hardware add-in card that fails to work.

Expandability: We scored expandability the same as speed—mathematically. We took into account the number of slots and drive bays, as well as other features that add value to systems. Some of these features include integrated VGA, VESA slots, largest available hard drive, RAM capacity, etc. We assigned points to each feature, and the machine that accrued the most points received the maximum score (210). All other systems received a percentage of the maximum points by dividing the results by the leader in the category.

DOCUMENTATION:

At a minimum, documentation should explain how to set up and use the system and include accurate diagrams to illustrate text. Comprehensive, well-organized, and well-written manuals receive higher scores. We lowered the score if the manual was poorly organized, lacked a table of contents and an index, did not include information on installing options, or contained factual errors in the text.

SETUP:

Here we evaluated how easy it is to configure, reconfigure, and upgrade a system. Items that boosted the score included useful front-panel displays, a limited number of jumpers or DIP switches, on-line users' guides for the system or DOS, and such keyboard extras as macro keys.

Items that hindered setup and lowered a system's score included poor slot layout; badly positioned or numerous jumpers and DIP switches; unprotected or missing reset and power buttons; and in ISA-based systems, setup utilities on disk rather than in the ROM BIOS.

SERVICEABILITY:

System design: We carefully examined systems to see how well they were designed and constructed. We awarded a good score to systems that followed standard design and manufacturing practices. Scores are lowered for patches found on the motherboard.

Support policies: A one-year warranty covering parts, labor, and unlimited (but not toll-free) technical support resulted in a satisfactory score. We awarded bonuses for unconditional money-back guarantees, on-site service warranties included in the purchase price, extended

See HOW WE TEST, page 53

FEATURES

INFO
WORLD

Intel-alternative desktop computers

	Austin 486/SLC-33 WinStation	CompuAdd 433DLC	IBM PS/2 56 486SLC2	Micro Express ME 486DLC/40	PC Brand Leader 486SLC/25	Polywell Poly 386-40R
System bus ¹	ISA	ISA	MCA	ISA	ISA	ISA
Number of parallel ports	1	1	1	1	1	1
Number of serial ports	2	2	2	2	2	2
Number of game ports	1	0	0	1	0	1
Built-in mouse port	No	No	Yes	No	No	No
Built-in VGA	Yes	Yes	Yes	No	Yes	No
Built-in IDE controller	No	Yes	No	No	Yes	No
Power supply (watts)	200	150	118	200	200	230
Memory type	SIMM	SIMM	SIMM	SIMM	SIMM	SIMM
Chip sizes supported	256K, 1MB, 4MB	1MB, 4MB	2MB, 4MB, 8MB	256K, 1MB, 4MB	256K, 2MB, 4MB	256K, 1MB, 4MB
Supports mixed sizes ²	Yes	Yes	Yes	Yes	Yes	Yes
Alternate processor speeds	No	Yes	No	Yes	Yes	Yes
Keyboard lock/disable	No	No	No	Yes	Yes	Yes
System lock/disable	Yes	Yes	Yes	Yes	Yes	Yes
Case lock	No	No	Yes	No	Yes	No

¹ISA = Industry Standard Architecture; MCA = Micro Channel Architecture.²Must be same size chip within a bank; can mix sizes among banks.

EXPANDABILITY

INFO
WORLD

Intel-alternative desktop computers

	Required for satisfactory score ¹	Austin 486/SLC-33 WinStation	CompuAdd 433DLC	IBM PS/2 56 486SLC2	Micro Express ME 486DLC/40	PC Brand Leader 486SLC/25	Polywell Poly 386-40R
Expandability points ¹		156	123	91	210	102	178
Maximum 32-bit system RAM	16MB	16MB	32MB	16MB	32MB	16MB	32MB
Standard system RAM support ²	4MB	16MB	32MB	16MB	32MB	16MB	64MB
Maximum external cache RAM	N/A	64K	256K	N/A	256K	N/A	256K
Number of 32-bit slots	N/A	0	0	0	0	0	1
Number of 16-bit slots	N/A	6	3	3	8	4	6
Number of 8-bit slots	N/A	0	2	0	0	0	1
Free slots after configuration ¹	4	4	5	3	5	2	5
Number of external drive bays ¹	N/A	3	2 ³	2	5 ⁴	4 ⁵	5 ⁵
Number of internal drive bays ¹	N/A	4 ¹	1 ¹	1 ¹	2	0	2
Free drive bays after configuration ²	2	2	1	1	4 ¹	2 ¹	2
Largest hard drive available from vendor	200MB	1.2GB	500MB	400MB	1.7GB	400MB	2GB
Coprocessor support	N/A	Cyrix	Cyrix	Intel	Cyrix	Cyrix	Watttek

¹For discussion of expandability and other scoring criteria, see How We Test, page 49.²Maximum RAM supported by main board.³Configuration comprises video adapter, drive controller(s), serial and parallel ports, memory, one hard drive (5 1/4- or 3 1/2-inch), and one half-height floppy drive (5 1/4- or 3 1/2-inch).⁴Drive bays are 5 1/4-inch half-height.⁵Includes 3 1/2-inch drive bays.⁶Drive bays are 5 1/4-inch half-height; two half-height bays support one full-height drive unless otherwise noted.

CPU upgrade modules soup up tired 386 PCs

For companies with a large installed base of older Intel 386DX-based computers, an alternative to buying a new system is to upgrade the processor. We tested two upgrade modules, a Cyrix Cx486DRu2 from Cyrix and an Intel 486DX2-based PowerUp module from Performance Pursuit Inc., on a Compaq 320e with 4 megabytes of RAM, a 100-megabyte IDE drive, an integrated VGA port, and one serial and one parallel port.

The clock-doubling Cyrix Cx486DRu2 runs at 20 MHz externally and 40 MHz internally. Though the PowerUp module from Performance Pursuit has a 486DX2/50 chip, it runs at 20 MHz externally and 40 MHz internally because our Compaq is a 20-MHz-based system. Unlike the 486DX chip, the Cx486DRu2 has a built-in integer hardware multiplier, which speeds some graphics calculations but not all math calculations.

The PowerUp kit came with an upgrade module and an external cache socket (ECS) for the Intel 82385 cache controller. Installation was a breeze. First we pulled the 386 chip off the motherboard and replaced it with the PowerUp module. We also removed the 82385

cache controller and installed it on the 82385 ECS, which was then reinstalled in the 82385 socket on the motherboard. We connected a wire from the ECS socket to the pin located on top of the PowerUp module.

Installing the Cx486DRu2 didn't prove as easy. Unlike with the PowerUp module, we experienced a clearance problem with the Cx486DRu2 because the chip

Neither module brings performance to the level of a typical Intel 486.

was topped with a heat sink, and the Compaq's 386 socket sits underneath the drive bay. There is also a 12-pin jumper block that has to be configured for compatibility with various system types. You can install the Cx486DRu2 on most 386 computers, whereas the PowerUp re-

quires different upgrade modules for different computer types.

Our standard Compaq 320e configuration yielded a SYSmark92 score of 40.29. With the PowerUp module, the rate almost doubled to 71.96. With the Cx486DRu2 and a Cyrix FastMath coprocessor, our test system posted a rate of 50.63.

A typical 486/33-based Intel computer yields a 100 SYSmark92. It's not surprising that neither upgrade module brought performance to that level. Most of the performance increase can be observed with such CPU-intensive operations as spreadsheets and word processors, with improvements of as much as 96 percent for the PowerUp and 32 percent for the Cx486DRu2. Disk-intensive applications showed the least improvements.

The two upgrade modules differ in design, which accounts for the significant difference in performance. The Cx486DRu2 chip, like other Cyrix chips, is not equivalent to an Intel 486. In addition to lacking a math coprocessor, the Cx486DRu2 has just 1K of on-chip cache, compared with the 8K in the Intel 486.

Both upgrade modules are available in volume. The Cx486DRu2 carries a \$415 price tag for orders of more than 100 or \$488 each. A math coprocessor runs an extra \$100. The PowerUp module costs \$1,095 each or \$931 in quantities of more than 100.

If your organization has 386-based machines and your users need to boost performance of CPU-intensive applications, these upgrades are worth a look.

Performance Pursuit, in San Francisco, can be reached at (800) 477-8101.

—Earl Anthony C. Angus



HOW WE TEST / from page 51 Intel-alternative desktop computers

support hours, bulletin board support (for example, on CompuServe), fax support, and a toll-free number. We subtracted points for no technical support or a limited support period. Dealer-only support can score no higher than a satisfactory.

Technical support: We scored this category based on a survey of our readers who buy and use desktop computers from the vendors we have reviewed. Our readers scored those products for which we received a statistically valid sample; for lesser known vendors, we made a series of anonymous calls to determine the quality of technical support. If we were unable to make anonymous support calls, we gave a default score of satisfactory.

PRICE:

This category was scored the same as speed and expandability — mathematically. The lowest priced unit received the full possible points for price (210). All other systems received a percentage of the total points. For computers sold directly, we used the manufacturer's suggested retail price. We scored on a street price — 75 percent of list price — for systems sold through the channel.

BENCHMARKS

**INFO
WORLD**

CPU upgrade modules

	Cx486DRu2	PowerUp	Compaq 320e
Performance*			
SYSmark92	50.63	71.96	40.29
Database	44.16	56.93	35.58
Desktop graphics	63.21	83.57	49.09
Desktop publishing	48.50	76.67	41.43
Software development	52.69	60.58	42.96
Spreadsheet	53.04	78.63	40.16
Word processing	47.96	71.71	38.38

*Higher numbers indicate better performance.

SUPPORT POLICIES

Intel-alternative desktop computers

	Required for satisfactory score	Austin 486/SLC-33 WinStation	CompuAdd 433DLC	IBM PS/2 56 486SLC2	Micro Express ME 486DLC/40	PC Brand Leader 486SLC/25	Polywell Poly 386-40R
Support policies		Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Warranty period	1 year	1 year	1 year	3 years	2 years	1 year	5 years ¹
Free on-site service	No	1 year	No	3 years	No	1 year	No
Money-back guarantee	No	30-day	30-day	30-day	60-day	30-day	30-day
Free vendor support	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Toll-free line	No	Yes	Yes	Yes	Yes	Yes	Yes ¹
BBS support	No	Yes	Yes	Yes	No	Yes	No
Fax support	No	Yes	Yes	Yes	Yes	Yes	Yes
Support hours ¹	Business hours	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	8:30a-6p, 9a-5p Sat, PT	8:30a-6:30p, 1p-6p Sat, PT
Technical support score ¹		Good ¹	Good	Good	Very Good ¹	Good	Very Good ¹

¹5-year labor, 2-year motherboard, 1-year parts warranties.

²Toll-free outside California only.

³Support hours are weekdays unless noted.

⁴Support based on reader survey unless noted.

⁵Score based on our calls.

**INFO
WORLD**

**REMEMBER LIFE BEFORE
MICROSOFT WINDOWS?
NOW YOU KNOW
HOW YOUR PRINTER FEELS.**



INTRODUCING THE MICROSOFT WINDOWS PRINTING SYSTEM.

Remember when you very first started to use the Microsoft® Windows™ operating system?

How you could suddenly access powerful features with just the click of a button? How your computer was miraculously talking your language?

How the two of you really started to communicate?



With the Microsoft Windows Printing System, now you can control your printer directly from your PC.

Well, we saw no reason the dialogue should end there.

So now we give you Windows for your printer: the Microsoft Windows Printing System.

Technically, it gives you a graphical user interface for all of your printer's capabilities. In lay terms, it lets you see what your printer's doing.

And it tells you virtually everything. The time it will take your document to print, the size of paper in the tray, whether the printer's out of paper or low

on toner, all the things you really need to know.

What's more, with the click of a mouse, you can easily select formatting options, paper orientation, halftoning, even choose two-sided printing.

The Windows Printing System is also the ideal TrueType® companion. Apart from anything else, it comes with 79 additional fonts.

And in the spirit of honesty in communication, you get true WYSIWYG output. No surprises.

Plus (and it's a huge plus) everything will print much faster. Up to five times faster.

Suffice it to say the Windows Printing System is an easier, faster way to print from Windows. And better yet, it works with Windows 3.1 and Series II or III Hewlett-Packard® LaserJet®.*

To find your nearest reseller or to simply find out more, call us now at (800) 426-9400, Department JMS.



Microsoft
Making it easier

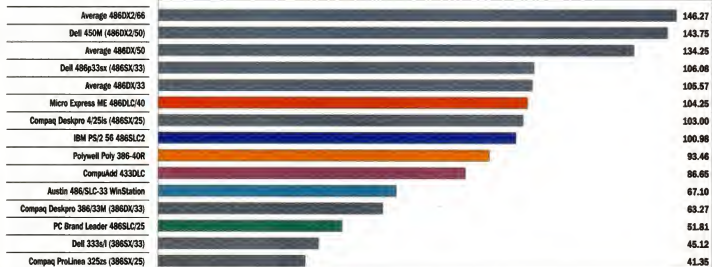
*HP® LaserJet Series II, IId, IIP, HP® III, IId or IIP. © 1993 Microsoft Corporation. All rights reserved. Printed in the USA. In the 50 United States, call (800) 426-9400, Dept. JMS; customers in Canada, call (800) 563-9049; outside the 50 United States, call (206) 736-8661. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. TrueType is a registered trademark of Apple Computer, Inc. Hewlett-Packard, HP and LaserJet are registered trademarks of Hewlett-Packard.

BENCHMARKS

INFO
WORLD

Intel-alternative desktop computers

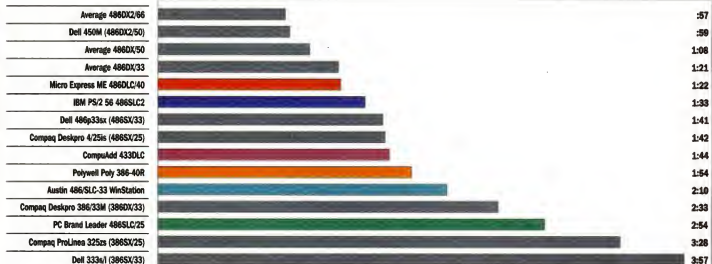
SYSmark*



Worse

Better

Multitasking*



Better

Worse

*Products tested by InfoWorld for this product comparison are represented by colored bars. Products represented by gray bars are for purposes of reference only.

	Austin 486/SLC-33 WinStation	CompuAdd 433DLC	IBM PS/2 56 486SLC2	Micro Express ME 486DLC/40	PC Brand Leader 486SLC/25	Polywell Poly 386-40R
Performance¹						
Database	66.36	81.92	91.80	105.72	46.80	89.87
Desktop graphics	65.91	85.57	103.68	122.23	61.51	108.55
Desktop publishing	70.95	96.34	120.61	107.28	55.53	94.62
Software development	85.85	77.20	88.99	117.75	63.48	105.75
Spreadsheet	67.71	87.17	104.04	97.14	49.99	89.31
Word processing	64.24	83.98	97.67	98.05	48.83	89.45

¹Higher numbers indicate better performance.

REVIEWS

Visual Basic 2.0 shows more maturity

Improvements make it a viable Windows programming tool for professional developers

By ROBERT A. DELROSSI REVIEW BOARD

In the early days of Windows programming, developers well-versed in C dove right in while their Basic and Pascal counterparts — mostly familiar with DOS — watched from the sidelines. One of the major turning points for Basic programmers was when Microsoft Corp. introduced Visual Basic 1.0. It gave Basic programmers a key to unlock the door into "visual" Windows programming.

With the release of Version 2.0, Visual Basic has evolved into a powerful application development tool for programmers at several levels of expertise. It is, quite simply, one of the easiest ways to develop Windows applications.

Visual Basic 1.0 was instantly embraced by hobbyists and part-time pro-

grammers, who generated an avalanche of public domain and shareware programs. But professional developers, for the most part, continued to use C, C++, and Pascal for Windows applications development. Visual Basic 1.0 might be used as a prototyping tool, but it lacked the speed and capacity and many of the sophisticated features required for serious application development.

In Version 2.0, many of the limitations that hampered Version 1.0 have been removed. Programs developed with Visual Basic 2.0 load faster, and their EXE files are often smaller than their C++ and Pascal counterparts. In addition, Visual Basic 2.0 programs can include four times as many procedures, twice as many variables per module, global constants, and almost unlimited string space — limited only by available memory. In addition, debugging is vastly improved in Version 2.0, and putting together MDI programs (where one parent window hosts one or more child windows) is a snap.

Visual Basic 2.0 comes in both standard and professional editions. The basic difference between them is in the number of custom controls and bundled tools. The standard edition includes two new controls on the toolbar: a grid and an Object Linking and Embedding (OLE) client control (originally available in Visual Basic's Professional Toolkit). The professional edition includes these two controls plus several more that enable you to access Microsoft's Mail Application Programming Interface (MAPI) and the Open Database Connectivity (ODBC) standard. There is also another collection of controls, some of which were developed by third parties: masked data entry, graphical gauges, spin buttons, impressive graphics capabilities, three-dimensional replacements for the common checkboxes and radio buttons, multimedia, and controls for building pen-aware applications. The professional edition also includes the Windows 3.1 Help Compiler, the Windows Setup Kit for building your own installation programs, and the Visual Design Guide for Windows.

We tested and scored the Professional edition of Visual Basic 2.0 based on our August 17, 1992, comparison of C++ Windows Development software (page 96).

PERFORMANCE:

Programming environment: All the tools you need to develop, run and debug a program are available in the Visual Basic integrated development environment. Separate windows display the toolbox,



Microsoft's Visual Basic, Version 2.0 enables you to view and select icons from an included library.

properties sheet, color palette, and project list.

The toolbox contains a pointer tool and icons that represent controls you create on your forms, such as entry fields, text labels, and buttons. Tools for adding shapes, lines, and images are now included. However, the real strength of the toolbox is the capability to add third-party tools.

All controls have properties — color, location, and default value. With Version 2.0, several of the controls have new properties, such as HelpContextID, which makes it easier to tie a specific help screen to the control.

The properties sheet displays all the properties for the selected control in a scrollable window — a major improvement from Version 1.0. In addition, you can use the pointer tool to draw a marquee around several controls and the property sheet will show you their common properties, such as their color, so you can change them all at once.

The color palette and project list haven't changed much. You use the color palette to change the color of a selected form or control. The project list shows you all the forms, custom controls, and code modules that make up the current project.

Forms you create have two different aspects: their physical display and the code "behind" them. The code embedded in a form (or any of its controls) is local and cannot be seen by other forms in your application. You can, however,

create code-only modules that contain Basic subroutines and functions. These code modules have no visual aspects but are often used to house routines that are shared by several forms.

Forms and controls respond to events that occur while your program is running. You can write message-handler subroutines in Basic to instruct an object how it should react when it receives a given message. For example, by double-clicking on a button object, you can open a code window for that button's Click message. You can select messages from a drop-down list and write code for them, too. However, Visual Basic only shows you the code for the message handler you are currently using. Arguments passed to the message handler subroutine are supplied by Visual Basic, cutting down on the possibility of typos.

The code window enables you to do syntax checking and user-defined color highlighting. Unfortunately, there's neither a way to break a long line of code over several lines nor a way to use a different font than the standard Windows system font. And because of the number of color choices available for different code elements, it's occasionally possible to confuse the syntax highlighting.

When you have finished developing an application, you can assign an icon to your program and select "Make an EXE" from the file menu to compile your work. Like Version 1.0, Version 2.0 does not create stand-alone executables. You will need to ship your program with a copy of VBRun200.DLL, but a royalty-free license is included. We rate programming environment excellent.

Language: Basic is a rich language with many statements and functions to both choose and confuse. Still, Visual Basic 2.0 manages to slip in just a few more commands and some useful enhancements. A few notable ones — FileCopy,

REPORT CARD INFO WORLD

WINDOWS DEVELOPMENT LANGUAGE

Visual Basic for Windows

VERSION 2.0



Criteria	(Weighting)	Score
Performance		
Programming environment	(150)	Excellent
Language	(150)	Very Good
Productivity	(150)	Excellent
Documentation	(100)	Excellent
Ease of learning	(100)	Very Good
Ease of use	(100)	Excellent
Support		
Support policies	(50)	Very Good
Technical support	(75)	Very Good
Value	(125)	Excellent
Final score		9.0

PRODUCT SUMMARY

Company: Microsoft Corp. can be reached in Redmond, Wash., at (800) 922-3675 or (206) 882-8080.

List price: \$495 for the Professional version; \$199 for the Standard edition.

Requirements: Intel 80286 or higher; Windows 3.0 or later, running in standard or enhanced mode; hard disk: EGA, VGA, 8514, or Hercules display; 1 megabyte of RAM; mouse.

Pros: Quick development environment, improved performance and capacity; easy to use.

Cons: Cannot create Dynamic Link Libraries; does not generate stand-alone executable files (programs require a royalty-free DLL).

Summary: Visual Basic 2.0 includes many new features that raise its stature from a prototyping tool to a full-fledged application development environment.

INSIDE REVIEWS

Toshiba Satellite T1850C.....	59
QMS 860 Print System.....	60
Owl Guide 3.1.....	61

The T1850C carries a low price for a color notebook

Toshiba's color technology improves passive matrix, but it doesn't equal active matrix

BY ANDREAS UTERWIK
TECHNICAL ANALYST
AND SIOBHAN NASH
ASSOCIATE REVIEWS EDITOR

When Toshiba American Information Systems Inc. unveiled its Satellite series of notebooks, they were impressive in both price and

design. Since then, the prices have fallen further, making them even better values. We tested the Satellite T1850C color notebook, running a 386SX/25 processor. To avoid the stigma of the passive matrix label, Toshiba uses the phrase "STN-LCD" to describe its color technology. And though it provides one of the best displays we've seen among passive matrix systems, Toshiba's screen still doesn't rival that of active matrix notebooks.

We found the T1850C to be a fair performer—faster than other 386SX-based color notebooks we've tested, but not as fast as color 386SLs—and the least expensive of the units we reviewed to date, at a street price of around \$2,500.

We tested the Satellite with 4 megabytes of RAM and an 80-megabyte hard drive. When running SYSmark92, the T1850C was close to 14 percent slower than the NEC UltraLite SL/25C, a 386SL color notebook. (See comparison of July 27, 1992, page 64.) However, the Toshiba unit was 6 percent faster than AST's Premium Exec 386X/25C (see same comparison). Again, the Satellite was slower than the NEC in multitasking tests, this time by 16 percent, and faster than the AST by just 2 percent.

The T1850C measures 11.8 inches by 8.4 inches by 2.3 inches. It weighs 8 pounds, 7 ounces with both battery pack and power supply; 7 pounds, 7 ounces without power supply but with the battery pack; and 5 pounds, 3 ounces without either battery pack or power supply.

Toshiba's Satellite, with its nickel-cadmium battery, posted one of the shortest battery times among the color notebooks we've evaluated, at 2 hours, 14 minutes, and 15 seconds. That's approximately an hour less than the AST Premium Exec 386X/25C. However, when compared to the NEC UltraLite color unit, the T1850C ran 30 minutes longer.

The Satellite T1850C comes standard with 4 megabytes of RAM, which is expandable to 12 megabytes. The largest hard drive available is 120 megabytes, and there is a 1.44-megabyte, 3½-inch

floppy drive. Included are ports for a parallel printer; external tape or 5¼-inch disk drives; serial; VGA monitor; keypad or enhanced keyboard; PS/2 mouse; and pointing device. The T1850C can also support a built-in proprietary Toshiba "E-style" modem slot and credit card memory slot.

There is a 9½-inch diagonal display, using a higher quality passive matrix color technology called Ultra STN. The T1850C does offer better color than standard

passive matrix screens due to its capability to support 256 colors. The output is crisp and the characters clear, but the cursor does blink a bit too fast. We were impressed with the lack of bleeding on screen when scrolling. Like all passive matrix displays, the T1850C's screen does

embedded Num Lock, Screen Lock, Overlay, and numeric keypad.

Toshiba includes a first-rate collection of documentation with the T1850C. There's a users' guide, reference manual, full DOS 5.0 manuals, concise Windows 3.1 guide, and a number of quick-ref-



The Satellite T1850C carries a street price around \$2,500—the least expensive color notebook we've reviewed thus far.

The Satellite, with its nickel-cadmium battery, posted one of the shortest battery times of the color notebooks we've evaluated.

fade out when viewing from angles, but it is evenly lit. This unit provides just a brightness control.

The Satellite's 82-key keyboard offers a medium stroke and good action, with an audible click. All keys are full size except for the half-size function keys. There are the usual accessory keys, with

ence pamphlets. The users' guide and reference manual are thorough and include detailed tables of contents and indexes, but only the reference manual includes a glossary. There are many useful illustrations, and the troubleshooting section is also detailed and comprehensive. The users' guide comes pre-installed on the Satellite, which is particularly helpful.

We found the T1850C easy to reconfigure, with two ways to reconfigure the power-saving features. You can access the pre-installed setup file on the system, which allows you to reconfigure the CMOS and set power management features such as resume mode, battery saving mode, speaker on/off mode, and low battery on/off mode. You can also change these settings, except for battery-saving features, via a pop-up menu. On-line documentation can be run in the background, allowing you to call up information when you need it. There are LEDs for power, DC in, battery, disk access, and overlay. We found using the power button as the resume key to be a little confusing at first.

Toshiba's Satellite sports a rugged design, solidly constructed with no loose parts to break or bend. We found no patches on any of the system boards.

The company provides a one-year parts and labor warranty as well as a next-day turnaround on service. Support is available via toll-free line from 7 a.m. to 5 p.m. Pacific time, and via BBS.

REPORT CARD INFO WORLD

NOTEBOOK COMPUTER

Toshiba Satellite T1850C



Criterion	(Weighting)	Score
Performance		
SYSmark92	(200)	Good
Multitasking	(50)	Satisfactory
Compatibility	(50)	Excellent
Size and weight		
8 pounds, 7 ounces with battery and power supply	(75)	Satisfactory
Battery life		
02:14:45; Nickel-cadmium battery	(75)	Satisfactory
Capacity		
120-megabyte hard drive; 4 megabytes of standard system RAM, expandable to 12 megabytes	(50)	Excellent
Screen readability		
9½-inch diagonal; 640-by-480 Ultra STN VGA	(75)	Very Good
Keyboard		
82 keys; firm stroke, audible click	(50)	Good
Documentation		
82 keys; firm stroke, audible click	(50)	Excellent
Ease of use		
System design	(50)	Very Good
Serviceability		
System design	(50)	Excellent
Support policies	(50)	Good
Technical support	(25)	Good
Value		
Final score	(150)	Good
Final score		
		6.9

PRODUCT SUMMARY

Company: Toshiba American Information Systems Inc., in Irvine, Calif., can be reached at (800) 334-3445.

List price: No published list price; street prices range between \$2,250 and \$2,500; includes DOS 5.0 and Windows 3.1.

Features: 25-MHz 386SX; parallel, serial, mouse, and keypad ports; 640-by-480 Ultra STN VGA display.

Storage and memory: 80-megabyte hard drive; 1.44-megabyte 3½-inch floppy drive; 4 megabytes of RAM standard, expandable to 12 megabytes.

Pros: Inexpensive; fine performer; Ultra-STN color display provides sharper color than current passive matrix technology.

Cons: None significant.

Summary: If you're looking for a color notebook but don't require the utmost in color technology, Toshiba offers a fine system at the lowest price we've seen yet.

BENCHMARKS



25-MHz 386 color notebook computers

	Toshiba Satellite T1850C	AST Premium Exec 386X/25C*	NEC UltraLite SL/25C*
Battery life			
	2:14:45	3:16:08	1:44:24
SYSmark92†			
	40.09	37.40	46.51
Multitasking‡			
	4:05	4:10	3:24
SYSmark92 applications			
Database	35.20	33.54	43.32
Desktop graphics	47.69	44.18	53.66
Desktop publishing	45.44	41.71	48.92
Software development	42.71	40.91	49.02
Spreadsheet	38.17	35.01	44.84
Word processor	38.56	36.19	44.82

*AST Premium Exec 386X/25C and NEC UltraLite SL/25C were reviewed in the July 27, 1992, product comparison of 25-MHz color notebooks, page 64.

†Higher numbers indicate better performance.

‡Lower numbers indicate better performance.

QMS tailors high-quality printer to small groups

860 Print System has great speed, print quality but is not designed for heavy use

By KYLA K. CARLSON
ASSOCIATE REVIEWS EDITOR
AND JILL WELCH TECHNICAL ANALYST

Expanding QMS' line of high-quality workgroup printers, the QMS 860 Print System offers 600-dot-per-inch (dpi) resolution, 11-by-17-inch paper support, PCL4, PostScript Levels 1 and 2, and numerous advanced features, thanks to the QMS Crown multitasking operating system.

The 860 is the top of QMS' line of 8-page-per-minute (ppm) printers and the only one to offer direct network support. It was the first printer to ship with Canon's LBP-BX engine, which produces true 600-dpi output and offers 11-by-17-inch paper support. However, the 860 Print System operates more quickly than most 8-ppm printers, due to RISC processing.

The Crown Advanced Document Processing Technology in the QMS 860 Print System (first seen in the QMS-PS 2000 shipped in June 1991) uses software code to accomplish multitasking functions. In a nutshell, the Crown technology uses advanced memory-handling features to allow the 860 to spool, compile, rasterize, and interpret multiple print jobs simultaneously over multiple interfaces. According to QMS, end-users will see notable performance enhancements when they send multiple jobs to the printer. We did not test for this.

We based this review on criteria in our last comparison of network laser printers (April 13, 1992, page 67).

In our speed test, the 860 Print System was competitive with printers that ship with faster speed engines. It was marginally slower than the QMS-PS 1700 in some of our tests, but the 860 beat the 1700's time to print a Microsoft Word document using PCL. The 860 was slower than the Hewlett-Packard LaserJet IIISI in all tests save Microsoft PowerPoint, in which the 860 was about 30 percent faster. We were unable to perform our duplex test, as the 860 does not support duplex printing.

The 860 passed our Genoa compatibility test after we fixed a minor problem. In Microsoft Word 5.0, Microsoft defined variables differently than in previous versions. This "confused" the printer and



The QMS 860 Print System offers high-quality 600-dpi output, 11-by-17-inch paper support, and an optional direct network connection.

caused it to print PostScript code. We easily fixed the problem by setting the input port to expect the QMS End of Document; this ensured that the printer would recognize the document and print it flawlessly.

The 860 Print System's font support was outstanding. The printer comes standard with QMS PostScript Levels 1 and 2 and PCL4. There are 35 PostScript typefaces (well over the standard 17 that Adobe ships with PostScript), in addition to four PostScript-compatible Helvetica Condensed typefaces. The 860 also retains downloaded fonts and forms when switching emulations.

The 860 offers fine 600-dpi output. We noticed no toner splattering, and the letters all had fine curves. The blacks were rich and the gradients smooth.

The QMS 860 Print System ships with 12 megabytes of RAM and is expandable to 32 megabytes. The 860 also supports up to seven external hard disks, which is ideal for downloaded fonts or extra emulations. Aimed at smaller workgroups, the 860 supports only up to 850 sheets in a paper bin. However, support for 11-by-17-inch output is a boon to those who need to use large paper sizes, such as desktop publishers. The 860 ships stan-

dard with serial, parallel, and LocalTalk interfaces and offers optional support for Ethernet (\$895) and Token Ring (\$1,095). An optional 500-sheet tray (\$129) and paper feeder (\$495) are available.

The documentation for the QMS 860 Print System was straightforward and thorough. There are several sections, including getting started, reference, and networks. We did, however, find it a hassle to assemble the documentation ourselves into the binder.

Setup of the 50-pound QMS 860 was fairly quick, taking us only 20 minutes. We had no problems configuring our applications and creating our NetWare print queues. The only annoyance was having to remove 15 screws to install our network card.

The 860 is well built and cleanly constructed. We found no patch wires, and its parts were easily accessible.

The QMS 860 Print System supports automatic emulation switching, which is ideal for network use. The printer also has a lengthy toner life of 6,000 pages. Although the 860 will do fine in network use, its paper-handling capabilities aren't as strong as those of larger printers such as the Hewlett-Packard IIISI or the QMS-PS 1700. The 860's standard input capacity is 350 sheets, and it will support as many as 850 sheets. The 860 does not have a job offset capability. The front buttons are easily accessible, and the front-panel display informs you of the printer's activities with the message "Active job."

QMS offers a one-year warranty and free vendor-supplied support from 8 a.m. to 5 p.m. Monday through Friday, Central time. QMS also offers fax and BBS support.

The QMS support staff was easy to reach, and they provided us with friendly and knowledgeable assistance.

The QMS 860 Print System is a strong printer for those who require high-quality graphics output, larger size paper support, or network support. Although it does not provide all of the advantages of a printer designed for larger networks, at \$4,595, the 860 offers solid features at an affordable price.

REPORT CARD INFO WORLD

NETWORK LASER PRINTER

QMS 860 Print System



Criteria (Weighting) Score

Performance

Speed (200) Very Good
Holds its own against QMS-PS 1700; slower than IIISI.

Compatibility (100) Very Good
Minor problems; easily remedied with help from QMS.

Font support (100) Excellent
PCL4 and PostScript Levels 1 and 2 support; 35 PostScript fonts plus four Helvetica fonts.

Output quality (125) Excellent
600 dpi; clean, smooth, with rich blacks.

Capacity (100) Very Good
Expandable to 32 megabytes of RAM; supports multiple simultaneous interfaces; only supports 850 sheets of paper.

Documentation (50) Very Good
Thorough and easy to follow; user must assemble in binder.

Setup (50) Very Good
20 minutes; need to remove 15 screws to install I/O card.

Ease of use (50) Good
Standard input of 350 pages; no duplex printing support; automatic emulation sensing and switching.

Workmanship (50) Excellent
No patch wires; clean construction.

Support

Support policies (25) Good
One-year warranty; fax and BBS support.

Technical support (25) Very Good
Support was polite and helpful.

Value (125) Very Good
600-dpi output; fast performance; \$1,000 less than HP LaserJet IIISI.

Final score **8.0**

PRODUCT SUMMARY

Company: QMS, based in Mobile, Ala., can be reached at (800) 631-2692; fax: (205) 633-0116.

List price: \$4,595.

Pros: Fast output at an 8-ppm printer; expandable to 32 megabytes of RAM; fantastic 600-dpi output; PCL and PostScript support with automatic emulation switching; 11-by-17-inch paper support.

Cons: No duplex support; smaller input capacity than other network printers.

Summary: The QMS 860 Print System is a fine solution for small workgroup environments or individuals who require quick output and high quality.

BENCHMARKS



Network laser printers

(TIMES IN MINUTES:SECONDS)

	QMS 860 Print System	Hewlett-Packard LaserJet IIISI	QMS-PS 1700
WordPerfect 5.1, regular	1:09	0:36	0:42
WordPerfect 5.1, duplex	N/A*	0:51	1:03
Lotus 1-2-3, PCL	0:26	0:16	0:20
Lotus 1-2-3, PostScript	0:30	0:24	0:22
Microsoft Word, PCL4	0:57	0:30	3:01
Microsoft Word, PostScript	1:07	0:39	0:35
Aldus PageMaker, PostScript	1:31	1:21	1:58
Microsoft PowerPoint, PostScript	1:23	2:11	1:02

*The QMS 860 Print System does not support duplex printing.

Guide delivers interactivity with enhanced multimedia tools

Version 3.1 excels at information delivery rather than razzle-dazzle presentations

BY JIM CANNING REVIEW BOARD

As one of the first Windows authoring tools, Owl International Inc.'s Guide features genuinely useful capabilities that result from years of development and customer feedback. This maturity sets it apart from other products in its class, such as Asymetrix Corp.'s Multimedia Toolkit.

Unlike the more sophisticated Icon-Author, Guide can't create animation (but it can import it). It's probably not the best product for those wanting to develop sales material or games.

Guide is extremely useful, however, for delivering information in a lucid manner. Hypertext training materials are less costly to reproduce, update, and distribute than paper manuals, procedures and catalogs. Hypermedia can also be interactive, helping people retain the information.

To evaluate Guide 3.1 we used the cri-

teria established in our March 9, 1992, comparison of multimedia authoring tools (page 76).

FEATURES:

Guide documents consist of indexed textual and graphical information that expand upon demand to reveal related material. Finished Guide titles may resemble on-line help systems such as those employing the Windows Help engine.

A well-done title should allow the viewer to quickly find a section of interest, then branch out to find related material. Guide's programmability allows the developer to go further, however, with the ability to track and record user responses and control a variety of multimedia devices.

An author can begin a project by importing existing multimedia data into a Guide document. Then the author links related material by defining hyperrelationships that the readers can trigger. You can distribute the finished titles royalty-free with Guide Viewer, Guide's included run-time application.

PERFORMANCE:

Programming environment: The developer builds a Guide document, using the toolbar and menu selections to import text and graphics. Although some titles may not require any scripting, complex projects can use Guide's scripting language, Logix.

Guide makes good use of the Windows environment. Mouse clicks create regions of text or graphics intended for use as triggers. The developer may toggle the visibility of these triggers' delimiters while in authoring mode (they don't show up during run time).

The Windows clipboard will import both text and graphics, and it can handle larger constructs such as frames (distinct pages within a single document).

Guide includes an integrated spelling checker that can span multiple documents and multiple dictionaries. A high-level serial port interface provides control over devices such as laser discs or VCRs.

The development environment lacks some visual guidance for experienced users. Guide doesn't prompt you through the steps required to build a hyperlink, which may result in incomplete or unresolved elements. Experienced developers won't need prompting, and they may appreciate the ability to leave unresolved links. Keyboard shortcuts will automatically link objects.

Command buttons, defined and linked by the developer, execute scripts written in Logix. You place a script in the Definition window associated with a particular document. (This is somewhat confusing at first because the tutorial uses the Definitions window to manage a glossary.)

Each document has its own Definitions area, a repository for links and scripts. You can share Definitions between documents, making it easier to reuse both scripts and other event triggers.

Logix syntax is close to Pascal. An interpreter, separate from Guide, processes scripts through the script and executes it at run time. Logix supports variables, conditional branching, Boolean logic, and



Guide 3.1 lets you interactively create hypertext titles. The interface is intuitive, and creating titles is not exceptionally difficult considering Guide's power.

string comparison and manipulation functions. Guide supports Dynamic Data Exchange (DDE) in both client and server modes as well.

We rate Guide's programming environment very good.

Hyperlinking: Guide offers a wealth of hyperlinking capabilities. From its inception, Guide has targeted the hypertext document market and has evolved a full set of hyperrelationships.

Guide uses the term "Object" to label any defined element in a title. The properties and attributes of Guide Objects are editable. "Unmaking" a Guide object removes its attributes so that it is again simple text or a graphical entity. A title is the primary Guide object for triggering events; four kinds of buttons are available.

Material within a Guide title is a collection of one or more documents and objects of various types. You can further divide a single document into frames.

You make an element of a trigger object by selecting it and then assigning an object type via the Make menu. After defining an object, the developer may link the object to a target object or to a Logix script. Multimedia objects (sound, CD ROM, animation, or video) are accessible through Logix calls to MCI, Windows' Media Control Interface.

When a reader clicks a note button (a word or string declared as an object), the definition associated with it pops up. A Logix script may take the place of the pop-up.

A powerful and unique capability is Guide's Glossary, a database for storing frequently used scripts, objects, images, or text. Unfortunately, it does not extend itself to allow global replacement of objects that have Glossary entries. This would allow automatic global updating of objects throughout a title.

Guide's facilities for tracing links and object relationships make management of large titles much easier. A separate product from Owl called Guide Professional Publisher (\$20,000) offers automated document conversion utilities for importing large quantities of text from

existing sources of electronic text and graphics. This product will automatically generate your links and objects necessary to make the document interactive.

We rate hyperlinking excellent.

Media and data import: Guide imports a reasonable number of file formats for both text and images, and it reads external multimedia files at run time rather than embedding them into a title. This allows your titles to be smaller, but you need to remember to include the external files whenever you distribute it.

Guide imports text through the Windows clipboard or directly from ASCII or Rich Text Format (RTF) files, RTF files come from Microsoft Word for Windows and allow styling text including boldface, underlining, and font parameters. The separate Professional Publisher package from Owl can help if a great deal of preformatted text exists. Owl creates custom import filters as well. International versions of Guide (French, German, and Kanji) are available.

Guide imports images, including 256-color bitmaps, directly into Guide documents. Guide will display larger images stored externally at run time. BMP, PCX, Device Independent Bit map (DIB), PCC (an older variation of PCX), Microsoft Paint (MSP), and TIFF bit map formats are available; WMF is the only supported vector format. Through Logix, Guide will read and write external files at run time. We rate media and data importing good.

Animation: There is no native support for creating animation within Guide. Logix scripting allows playback of third-party, MCI-compatible animation files. Although third-party animation products offer better tools than those included in other multimedia authoring systems (such as Asymetrix's ToolBook), a complete multimedia authoring product should include rudimentary capabilities. We rate animation satisfactory.

Application linking: When assigned to a command button, Guide's Launch function starts either Windows or DOS applications. In the case of Windows applications, the developer can also spec-

REPORT CARD INFO WORLD

MULTIMEDIA AUTHORING SOFTWARE

Guide

VERSION 3.1

Criteria	(Weighting)	Score
Performance		
Programming environment	(125)	Very Good
Hyperlinking	(100)	Excellent
Media and data import	(100)	Good
Animation	(50)	Satisfactory
Application linking	(50)	Very Good
Documentation	(125)	Very Good
Ease of learning	(100)	Good
Ease of use	(100)	Good
Support		
Support policies	(50)	Good
Technical support	(75)	Very Good
Value	(125)	Good
Final Score		7.0

PRODUCT SUMMARY

Company: Owl International, in Bellevue, Wash., can be reached at (800) 344-8737 or (206) 747-3203; fax (206) 641-9367. List Price: \$795; upgrades to Version 3.1 are \$199.

Requires: DOS 3.1 or later; Microsoft Windows 3.x; a Windows-compatible PC with hard disk; VGA or better display; a Windows-compatible mouse or other pointing device.

Pros: Excellent hyperlinking capabilities, easy to learn, good tutorials and documentation, unlimited royalty-free run time.

Cons: Lacks Object Linking and Embedding support; no automated conversion of existing documentation; no cross-platform support.

Summary: Guide 3.1 for Windows is a powerful and useful tool for creating interactive documentation and technical reference titles.

ify whether the application will start as a full-screen, partial window, or icon. Guide does not support Object Linking and Embedding (OLE).

Guide operates as either a client or server in a DDE link with another Windows application. For example, the developer could script a Logix program to look up pertinent information in an Excel spreadsheet, or perhaps record the results of an interactive quiz to a database. Used in conjunction with variables, Logix and DDE extend the power of Guide to handle more complicated tasks

than simply displaying a hypertext document. We rate application linking very good.

DOCUMENTATION:

The well-organized manual features many clear illustrations and diagrams. Extensive graphics help illustrate key points, dialog box examples, menu choices, and script listings. Each section has its own index (only one or two entries had inaccurate page references).

Guide's on-line help is a Guide title, so it doesn't follow the standard Windows

help conventions. It is quite simple and obvious to use, however. There is an on-line tutorial. We rate Guide's documentation very good.

EASE OF LEARNING:

Guide proved relatively easy to learn. Although it doesn't prompt the developer to complete a link, it is easy to grasp how to create complete links between elements. Button types and their meanings take some time to understand.

The tutorial is clear and concise, but it lacks illustrations of the icons to which

the text refers. Because the on-screen icons lack labels, you must turn back to look up which icons mean what.

A fine introduction to planning a structure for a Guide title lies buried in Chapter 12 of Advanced Topics. This section should come much earlier and receive more prominence because it explains the basic design and organization of an effective Guide title much more clearly than the tutorial. We rate ease of learning good.

EASE OF USE:

Once you've planned the structure of your multimedia title, it is relatively easy to build it using Guide. If a major change becomes necessary, restructuring a title shouldn't prove difficult because the clipboard moves documents with links intact. Hyperlinks and the tools to manage them are simple to understand.

Guide 3.1 may prove more daunting for large projects. Owl considers Guide its entry-level product for title development because Guide doesn't automate the process of converting existing documentation into an interactive equivalent.

If the project at hand doesn't involve such a conversion, this isn't much of a drawback. But when converting a large body of existing text, the tedium of building links and note buttons becomes a serious factor to consider.

Guide Professional Publisher is Owl's solution for large projects. However, there are some basic functions (automatic definition of terms link generation, for example) that would make Guide 3.1 much easier to use. Owl does make the specifications for its HTML mark-up language available upon request, so adventurous programmers or Microsoft Word Basic developers could develop their own utilities. Ease of use is good.

SUPPORT:

Technical support: Owl offers free, but not toll-free, telephone technical support for Guide 3.1. Support lasts until six months after a new release ships, so users who upgrade continue to receive free technical support. There is a 30-day money back guarantee and on-line support through CompuServe. We rate support policies good.

Technical support: Owl's technical staff promptly answered all our calls. Technicians provided accurate, clear answers and suggested alternative solutions to problems. We rate technical support very good.

VALUE:

Guide's list price of \$795 is reasonable for its capabilities. Competing hypermedia products, such as Microsoft's Multimedia Viewer, don't offer the high-level features and programmability that Guide does. General-purpose tools such as ToolBook, although less expensive than Guide, may end up costing more in development time on projects that are primarily hypertext.

However, Guide is not a product for those who need to create. It's perfect for delivering information clearly in an interactive format. Icon Author and Authorware offer more tools to developers on the Windows platform, but they are far more expensive than Guide.

This is the first release of Guide to feature a royalty-free run-time license. We rate value good.

Jim Canning is an independent multimedia title developer with Stratos Systems, in Sunnyvale, California.

Discover 100s of PC SECRETS™

Never Before Revealed in Hardware Manuals



Do you find setting up new hardware, upgrading software, or adding new modems or printers a real chore? Do you wonder why your system seems to be getting slower the more you use it? Do you worry about viruses or hard crashes scrambling your data?

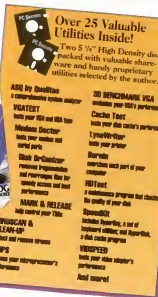
Now PC hardware expert Caroline Halliday reveals hundreds of practical tips and insider secrets for all your system's components — PC, keyboard, mouse, monitor, and peripherals — and includes over 25 valuable utilities on two disks, handpicked by the author to help you analyze, troubleshoot, test, and configure your system — without programming or difficult tinkering under the hood.

Lined with photos and illustrations, this national bestseller's easy-to-understand approach and clear explanations of technical information make it the ideal first aid kit for anyone looking to maximize their PC's performance, debug system problems, and perform simple repairs.

PC SECRETS™ gives you expert advice on:

- How to install, test, and troubleshoot memory, adapter boards, coprocessors, and disk controllers
- Analyzing and configuring your hard disk, I/O ports, and video systems

Let IDG's Tech Support Expert Show You How To Configure, Troubleshoot, and Optimize Your PC's Performance with PC SECRETS™!



- Working with MCA, EISA, and 286, 386, & 486 PCs
- Tailoring your system for maximum performance with database, spreadsheet, CAD or DTP-based applications
- Getting the most out of printers, plotters, keyboards, monitors, mice, and modems
- Managing device drivers and TSRs to avoid conflicts and improve performance

ISBN 0-8952-85-00-0, 800 pages, two 5 1/4" disks, \$29.95 1-87854-015

Also Available:

Windows 3.1 SECRETS™
InfoWorld Windows Manager columnist Brian Livingston offers you a treasure trove of hard-to-find Windows tips, undocumented features, and insider advice. Includes 3 disks containing over 40 fully documented utility programs representing the Best in Windows Shareware. "I don't care how many Windows books you already have, get this one. If you have this one, it's not likely you'll need another. Windows 3 SECRETS hands down wins the User's Choice Award for Best Windows Book of 1991!" —Jerry Pappas, BYTE Magazine, April 1992 on the first edition of Windows 3 SECRETS

ISBN 0-8952-85-00-0, 800 pages, three 5 1/4" disks, \$29.95 1-87854-015

PC World Excel 4 for Windows Handbook

InfoWorld spreadsheet expert John Walkenbach and David Maguiness help you master Excel 4 with this complete tutorial and reference featuring hundreds of hands-on tips and shortcuts. Includes FREE 32 Quick Reference Booklet.

ISBN 0-8952-85-00-0, 700 pages, three 5 1/4" disks, \$29.95 1-87854-015

The World of Computer Knowledge

IDG Books Worldwide
155 Boylston Street, Suite 610
San Mateo, CA 94402
(415) 312-0650 (800) 762-2974



Order Now! 1-800-762-2974

Available in paperback, paperback & computer book edition 8 1/2 x 5 1/2 in. PST or airmail and Mail to form below

Yes! Please send me:	Qty	Price	Tax*	Ship	Total
PC SECRETS	_____	\$39.95	_____	\$4.00	_____
Windows 3.1 SECRETS	_____	\$39.95	_____	\$4.00	_____
PC World Excel 4 for Windows Handbook	_____	\$39.95	_____	\$4.00	_____

USPS Shipping & Handling (\$4 per book) *CA residents add applicable county sales tax. No. residents add 5% tax. Canadian residents add 7% GST tax.

Name _____ Payment method (payment with card number or check, US funds only, must accompany your order)

Company _____ ☐ Check Enclosed ☐ Visa/MasterCard/AmEx/Discover Express

Address _____ ☐ Card

City, State, Zip _____ Expiration Date _____

Phone _____ Signature _____

Inquire about rush delivery services (an extra charge will apply) Corporate/quantity discounts available

INFO MARKET

Combining vision and technology, products drive the PC industry. As innovations become standards, the next revolution begins...and the future history of computing is being written by the companies whose products appear in InfoMarket.

NEW PRODUCTS

What's new? It's a question computer users never tire of asking. Smart buyers and trend-watchers look here for the latest in PC products and services.

SOFTWARE

From E-mail to project management, spreadsheets to utilities, here you'll find a wide range of power and value in software, all conveniently designated by category and platform availability—DOS, Windows, OS/2, Unix, and Macintosh.

SHOWCASE

By setting standards we can live with, some products become standbys without becoming old. Showcase turns a spotlight on those that have stood the test of time.

DIRECT CONNECTION

Here's your "quick reference guide" to a broad array of PC products and services. All organized under convenient, easy-to-find headings.

COMPUTER CAREERS

Careers grow and change with the PC industry. For both computer professionals considering a change and companies in search of qualified people, this is the place to meet.

TRADESHOWS

For the PC industry, trade shows are where products get seen and business gets done. This section of InfoMarket keeps you informed of important current and upcoming industry events.

For information about appearing in InfoMarket,
call 1 800 227-8365.

CONTROL ALL YOUR NETWORK SERVERS FROM ONE KEYBOARD AND MONITOR!

With MasterConsole® you can:

- * "Plug and play" any combination of IBM ATs and PS/2s (all models) or compatibles, VGA, SVGA or TTL video.
- * Control up to 64 PCs - Servers, Bridges, Gateways using models with 2, 4, 8, or 16 connections. Desktop or 19 Rackmount models.
- * When not working on a PC, set AUTOSCAN™ to monitor all PCs, one after another.
- * Insure 100% reliability with keyboard emulation. Error-free PC booting, PC switching, PC access.
- * Add Remote panel for dual access up to 150 ft.

Save \$

Save Space

Save Time

Thousands of MasterConsoles are already in operation throughout the world. GSA approved. See for yourself how effective MasterConsole can be. Call Today!

RARITAN COMPUTER, INC.
18-1 Irena Court, Belle Mead, NJ 08502
(908) 874-4072 • Fax (908) 874-5274



We Made Printer Sharing A Snap!

Primax created the modular printer sharing concept, and others put their name on it. Now you can get the original ModularLINK™ and its patented and reliable technology directly from the Original Equipment Manufacturer! For truly hassle-free printer networking, look to ModularLINK – the original Simple Printer Network™!

- ▼ Over 500,000 nodes installed worldwide
- ▼ Connects 16 PCs with a single printer.
- ▼ Starter Kit for 2 PCs and 1 Printer only \$129.95.
- ▼ Fully compatible with existing SNAP™ networks.
- ▼ Power free in most applications.

PRIMAX
Primax Electronics
800-338-3693
SNAP™ is a trademark of ASP Computer Products Inc.

The A.I.R. 486 EISA/VESA Local Bus "Total Solution."

A.I.R. meets the need for a "Total Solution" EISA/VESA VL-Bus manufacturer. The A.I.R. 486E1 system board is industrial strength. With up to 256 MB on-board system memory, 512K cache and 3 EISA/VESA VL-Bus slots, the 486E1 can handle any job.

To support this system board, A.I.R. manufacturers a line of peripheral cards in EISA and VL-Bus configurations. With SVGA, Ethernet, SCSI and IDE peripheral support, no application is too tough for an A.I.R. solution. Call A.I.R. today to order these industry leading products.



A.I.R.
Advanced Integration Research, Inc.

2188 Del Franco St
San Jose, CA 95131
(408) 428-0800

HASSLE-FREE PRINTER SHARING

LOW-COST, MODULAR PRINTING NETWORK FOR UP TO 20 COMPUTERS

Let your printer sharing network GROW with your office. It's called **SNAP II**. Simply plug a transmitter to the parallel port of each computer, a receiver to the printer and connect with modular phone type cable. To add computers, simply "snap" them into place anywhere along your existing **SNAP II** network. Installation is a snap!

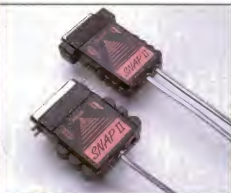
WE MADE IT BETTER!!!

- ✓ FREE upgrades from **SNAP I** to **SNAP II**
- ✓ Connects up to 20 systems, versus 16
- ✓ Customize your system with up to 1400' of modular phone cable.
- ✓ Made in USA

800-445-6190
Dept 23171

ASP
ASP COMPUTER PRODUCTS, INC.

Tel: (408) 746-2965
Fax: (408) 746-2803



Thrive in the Data Jungle...

With the Percon® family of
Bar Code Reading Products!

DECODERS • INPUT DEVICES PORTABLE BAR CODE READERS



PERCON IS YOUR BAR CODE SOURCE!

All Percon products are proven and reliable, with excellent first-try read rates, exceptional warranties, toll-free technical support, and rapid shipping on most orders and repairs.

CALL US TODAY!
1-800-929-3951

The Fastest Portable Fax Modem: The Best at Direct Prices

57,600 bps V.32bis V.42bis 14,400 data, 9,600 fax, MNP5

Why buy a Desktop size fax modem? This one looks great, works just as well. Anywhere. Not some knockoff, this is a \$499 list fax modem which we sell around the world, and this is our US introduction. Comes with carrying pouch, Quicklink II for DOS or Windows or Mac and 1 year warranty. 9696 and 2496 models also available. Call for special pricing.



\$299

Visa/MasterCard

DirectCo

Phone (408) 867-9697
Fax (408) 997-1117

Ask About Our
Introductory Special!

LCD Projection... Big Screen Presentation Power

Impress Your Boss &
Dominate Your Co-workers!

- Passive Color Panels From \$1,995
- Active Matrix Panels From \$3,395

- Full 640 X 480 VGA / Mac, VCR Input Optional, High Resolution Panels Also Available
- Stand-Alone Video/Data Projectors Also Available
- Expert Technical Support, Satisfaction Guaranteed, Or Your Money Back



Call Now For a FREE Brochure 1-800-726-3599

Panelight

In San Francisco Call: 415-772-8800

1040 Ferry Building, Box 263 San Francisco, CA 94111

Hours: 9:30 to 5:30 PST 2-926-2351 Ext. Audio. Distributors for Leading Active, Passive Matrix LCD Panels from: PC/Media/Res. & Video/Multimedia. MC/VISA/AMX. Fortran 1000 & Institutional. P.O. 000

50MHz 486DX2 Color NoteBrick \$3,995

Meet the Color LCD NoteBrick that's as powerful as a desktop 486. Now you don't have to compromise for on-the-go computing. With this kind of performance in a handy package why even bother with a desktop PC?

Actual Screen shown



- 50MHz Intel 486DX2
- 4MB RAM std., 8 or 16MB opt.
- 120MB HDD std. 180MB opt.
- Color STN VGA LCD
- 8.5" x 11" x 2", 6.7 lbs.
- 1024 x 768 ext. simultaneous CRT support
- 2-slot full length ISA Exp. module
- Mono LCD 486's from \$2,295
- 30-day moneyback guarantee

For information, M-F, 9-7 EST
1-800-633-1925



One Intercontinental Way,
Pleasanton, MA 01965
(508) 535-7510 FAX: (508) 535-7512

Secure that computer!

Physical Security for

NOTEBOOKS • LAPTOPS • PORTABLES

Secure-It, Inc. introduces **The Kabitz VANGUARD** security system. Now you can secure your notebooks, laptops or portable computers easily and quickly no matter where you are...in the office, home, hotel, car, or the airport.

It's easy! Just attach the Kabitz VANGUARD lock base to the screw holes of an available, unused port on your computer (excluding Macs). It's as simple as that.



THE VANGUARD
system includes:

- High security lock
- 6" vinyl covered 7x19 steel cable
- Fasteners for desk or for traveling
- Attractive carrying pouch that fits in a briefcase.

List Price - \$49.95

Secure-It

18 Maple Court
East Longmeadow, MA 01028
800-451-7592
413-525-7039

ATS Data Storage Solutions

Featuring Hewlett-Packard's HP 35480 4mm DAT Drive

The HP 35480A 4mm DAT is the leading performer in data storage technology, offering up to 8.0 Gigabytes of storage capacity, a 732 Kbytes/sec Data Transfer Rate, a SCSI-2 Interface, a compact 3.5-inch Form Factor, a 1-year Warranty and an industry-leading 50,000 Hour MTBF. The HP 35480A, equipped with the optional LCD face plate, will display current DAT operation, data transfer rate, total data transferred, compression ratio, and remaining capacity. The HP 35480A is fully compatible with DOS, Novell, Unix/Xenix / OS/2 operating systems and PC, MAC, DEC, SUN PS/2, RS/6000 & HP 9000 platforms. ATS solutions are protected by a 30-day, 100% money-back guarantee.



800-793-8689
1160 Ridder Park Dr.
San Jose, CA 95131
FAX: (408) 441-4503



COMMANDER

Control up to 96 file servers with one keyboard, monitor and mouse!



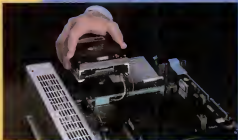
- Supports PC, PC/XT, PC/AT, PS/2 and 100% compatibles
- Remotely switch PCs via keyboard up to 150 feet away
- "AutoBoot" Feature boots attached computers without operator intervention
- Supports either PS/2 or Microsoft/Logitech serial mouse
- Each unit accommodates from 2 to 8 PCs; cascade up to 12 units



2800-H Bob Wallace Ave.
Huntsville, AL 35805
(205) 534-0011
FAX (205) 534-0010
Dealer Program Available
Made in USA



PS/2 Storage Blues?



DISKS
TAPES
OPTICALS

2nd INTERNAL DRIVE

- 2nd drive mounts in spare floppy bay
- Built in OS/2 support
- Fast SCSI-2 support
- Up to 1GB capacity
- 10 to 15ms access time
- Second internal drive for PS/2 50, 55SX and 70



PERISOL TECHNOLOGY
800-447-8226 408-738-1311 FAX 408-738-0698

PC-EXTENDER PLUS™

Extend this distance between your PC and a keyboard, VGA monitor and mouse up to 250 feet!



- Supports PC, PC/XT, PC/AT, PS/2 and 100% Compatibles
- Supports monochrome or color VGA monitors
- Offers conversion from RGB color to gray-scale
- PS/2 style or Microsoft/Logitech serial mouse support available



2800-H Bob Wallace Ave.
Huntsville, AL 35805
(205) 534-0011
FAX (205) 534-0010
Dealer Program Available
Made in USA



Quality, Savings, Service... Directly from Manufacturer

AMREL 486

UPGRADEABLE NOTEBOOKS

AMREL CPU Modules

AMREL MLT486 Notebook computers feature state-of-the-art plug in CPU Modules for fast and economical processor upgrades. Increase your computing power by simply replacing the AMREL CPU Modules. CPU Options include 386DX33, 486SX 25, 486DX 33, 486DX2 50 & 486DX2 66 MHz.

AMREL Docking Station

AMREL Docking Station delivers the power and expandability of desktop PCs to your MLT486. Features include two 16-bit ISA slots, internal Fax/Modem, RS232 port, parallel port, VGA, external keyboard port and room for a 5 1/4" drive.

AMREL Trackball

Convenient built-in trackball eliminates the need for awkward add-on devices.

1-800-88 AMREL
Fast Fax: (818) 575-0801



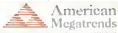
Starting as low as... **\$1795**

ADD IT ALL UP...

- 30-DAY MONEY-BACK GUARANTEE
- IMMEDIATE SHIPPING
- ONE FULL YEAR PARTS & LABOR WARRANTY
- 48-HOUR SERVICE TURNAROUND TIME
- TOLL FREE TECHNICAL SUPPORT

AMERICAN RELIANCE INC.
9952 E. Baldwin Place, El Monte, CA 91731

FACTORY AUTHORIZED DISTRIBUTOR

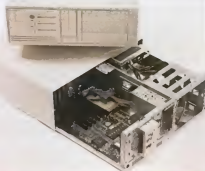


PC Class B Bare-bones from American Megatrend

New quality US-made American Megatrends motherboards are available as FCC Certified Class B Bare-bones Systems:

- Baby AT w/ ISA 486 Motherboards
- Medium Tower w/ ISA 486 Motherboards
- Large Tower w/ ISA 486 Motherboards

We are the AMI speaker! Not just motherboards in and out of Warranty service, support, accessories (we stock all AMI RAM Expansion Cards), BIOS updates and selected peripherals.



AMI 486SX/DX2 Motherboards:

"Super Voyager"
BX250SX/DX250/DX2-66 MHz, 64k Cache (256k opt) Floppy, IDE, 25/1P on-board \$405/464/596/526/1160

AMI EISA Motherboards:

"Enterprise T" 486DX 33/50MHz MHz, 128k Cache, Floppy on-board \$935/1611/301

"EZ-Flex" Changeable CPU - 486DX 33/50MHz Floppy, 25/1P on-board \$1312/1707/1985

AMI EISA SVGA Graphics Adapter:

"FastView" 512K/1MB VRAM \$314/372

AMI EISA SCSI Host Adapter:

"FastDisk" Cached Controller (can use 1, 4, or 16 MB of SIMM Cache RAM) \$448



Wholesale & Company, DISTRIBUTORS
Pittsford, NY
800-836-8026
716-248-3627
FAX 716-381-7549
MCVISA/AMX/NO Surcharges
9-5 Eastern

NEW PRODUCTS

EXTERNAL PC-VIDEO CONVERTER

Converts VGA output to NTSC.

Turn any color TV into a computer monitor. Use "Off The Shelf" Software for animated presentations on TV.

INCLUDES...

- Video Converter
- Software Utilities
- Cables
- AC Adapter

**NEW
LOW
PRICE**

\$99

**BOFFIN
LIMITED**

612-894-0595

FAX: 612-894-6175

2500 W. COUNTY RD. 42 • #5
BURNSVILLE, MN 55337

How to make money with fax-on-demand

Customers call your Faxcess™, select from hundreds of stored documents, enter their fax number and instantly receive by return fax the information they need to do business with you now...before your competitor's information is even in the mail.



Your customers dial for a fax to get the facts to buy now.

Free

• FAXCESS™ works 24 hours a day, 7 days a week. Great for detailed product or customer support information.

• Order today, FAXCESS™ tomorrow. Works out of the box. Nothing else is required. Easy to set up. Callers love it.

• Join the thousands of companies making and saving money with this exciting technology from only \$2495.

For a live on-line demonstration call 1-800-FAX-DEMO

Request information document 444...

ComArt International
PO Box 1450 • Lake Forest, CA 92650
(800) COM-ARTS • (714) 859-2000



PC Screen to Big Screen!

Maximize Meeting Time... Minimize Expense



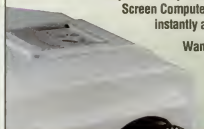
You'll save up to 87% of your meeting costs when you couple the full power of your computer with an ordinary overhead projector.

No more copies, slides or transparencies...and you can make changes on the spot, animate, and project variables, too.

The Best & the Brightest!

Project High-Impact Images on a Low-Impact Budget!

You can project vibrant color graphics, photographic images and even video with extraordinary color quality. Boxlight's Projectors, Projection Panels and Detachable Screen Computers make big impressions instantly and easily.



Want to try it for an important meeting? Ask about the Boxlight Lease and Rental Programs.

Boxlight boasts the best prices, the most knowledgeable staff, the strongest guarantee and the fastest shipping.



BOXLIGHT
Your Telephone
SUPERSTORE
for Computer Projection!
(800)497-4009

It's easy! Plug the panel into your computer... Place it on any overhead projector... See your entries, edits and revisions right on the big screen!

Our Business is Helping You Show Off Yours...



Keeping up with technological innovations and advances is a full time job. Ours. That's why most of the Fortune 500 companies, Big 8 accounting firms, major universities and institutions rely on Boxlight's expertise. We specialize in meeting and presentation technology. We can guide you to the products that will meet your current needs and prepare you for your future. And we'll do it at the best price available. We guarantee it!

Call our Sales Advisors TODAY!!!
(800)497-4009

30 Day Money-Back Guarantee

Ordering: Toll Free 800-497-4009 FAX 206-779-3290
Payment: Mastercard, Visa, AmEx (no surcharge), CDO,
payment, Purchase Orders with some restrictions.
Shipping: Same day or next order, UPS or Fed Ex.
Next Day & 2nd Day delivery available.



BOXLIGHT®
CORPORATION

Utilities



Supercharge Your PC with PC SECRETS™



This comprehensive yet practical guide to optimizing your PC's performance contains two valuable disks of utilities to help you configure, diagnose, analyze, and troubleshoot your system.

• Hundreds of SECRET tips to maintain keyboards, printers, plotters, digitizers, mice, modems, monitors, device drivers, hard disks, and more!

• Includes two disks of over 15 ready-to-use utilities, including Quaker! ASQ, VGATEST, and Modem Doctor!

PC SECRETS by Caroline M. Halliday,
Member of the InfoWorld Review Board.
ISBN: 1-878058-49-5. 616 pages, includes two 5 1/4" disks.
\$39.95 USA/\$52.95 Canada, + \$4.00 s/h.

To order, call IDG Books at:
1 (800) 762-2974, 7 a.m. to 5 p.m. PST

INWSW

Connectivity

Discover the X Terminal
Inside Your PC!

X-One software transforms your PC into an X terminal. Access network-based UNIX and VMS applications while using your favorite DOS or MS-Windows programs. Whether you prefer MS-Windows or DOS, X-One comes with both versions in a single package. Other cost-saving features include built-in TCP/IP network software—making X-One an even greater value. X-One is easy to install and use, and is compatible with leading network packages.

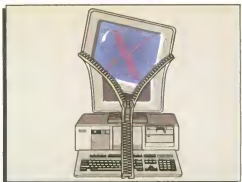
Purchase X-One and connect to the world of X Windows!

Call for Demo & Details: (800) 426-2230



GRAFFIPOINT™

1485 Saratoga Avenue • San Jose, CA 95129 • (408) 446-1919; (408) 446-0666



SOFTWARE

InfoWorld



This is the Place...



...to find software for every major platform: DOS, Windows, OS/2, Unix, and Macintosh. It's InfoMarket's new SOFTWARE section.

Here's where you'll find a wide range of power and value in software—from E-mail to project management, spreadsheets to utilities—all conveniently designated by category and platform availability.

And you'll find it here every week.

Utilities

Serious About
Hard Drive Setup?

- ▶ IDE Quick Install - Plug Drive in and DrivePro will make your drive "data ready" in under 60 seconds.
- ▶ Drive Table Override - Allows any BIOS to have user definable drive types. No device drivers required!
- ▶ Automatically identifies and displays information on ESDI, IDE and SCSI drives connected to the system. Actually retrieves manufacturer's recommended specifications from the drive itself.
- ▶ Complete list of hard drive specifications from 1984 to present.
- ▶ Guided install to walk the novice through drive installation.
- ▶ Allows you to use your IDE drives with existing MFM / SCSI / ESDI drives.

DrivePro
Professional Hard Drive Setup



For Complete Information call:

800 - 926 - 8299

FAX: 303-443-3323

BBS: 303-443-9957



Micro House 4900 Pearl E. Circle Suite 101 Boulder, CO 80301

Graphics



An Introductory Offer From NETWORK WORLD

- The first clip-art created for networking and computer professionals
- Over 170 professionally drawn symbols for Computing, WANs, LANs, Telephony, Personal Computing and Patching and Cabling
- Available in Macintosh, DOS and Windows versions
- Offered at the low, introductory price of \$99.95

NetDraw Clip Art for Building Networks™

Call 800-643-4668 To Order Today!

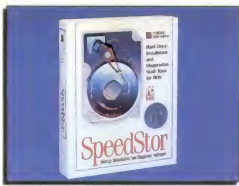
Utilities



Hard Drive Installation and Diagnostics Made Easy.

Now, adding a hard drive to your system is as easy as typing "install." SpeedStor™ automatically performs all of the operations to make your drive "data ready." And to keep your drive "data safe," SpeedStor contains critical diagnostics not found in DOS that safeguard your data and ensure your drive is always trouble-free.

SpeedStor is available at Egghead Software, Best Buy, Computer City Supercenter, CompUSA, ElekTek and Software Etc. Order today. Call 1-800-344-4323.



Upgrade to version 6.5!

\$19.95

Call: 1-800-344-4323



**STORAGE
DIMENSIONS**

1656 McCarthy Blvd., Milpitas, CA 95035
(408) 954-0710 FAX (408) 944-1200

Utilities



WINDOWS HELP AUTHORING SYSTEM



RobotHELP™ is an automatic authoring tool that makes the process of creating a Windows Help System just a matter of pointing and clicking. Guides the user through all the necessary steps - the user just fills in the actual help text when prompted.

RobotHELP features a customizable tool palette. Generates source code for context sensitive help, hypertext link, cross reference, etc. RobotHELP takes care of generating the complex, precisely formatted RTF files. Programmers and non-programmers alike can develop a Help System under Microsoft Windows 3.x - no need to know anything about Windows programming or the Windows help Compiler.

Blue Sky Software Corp.
7486 La Jolla Blvd., Ste. 3
La Jolla, CA 92037 USA
Tel: (619) 459-6365 • Fax: (619) 459-6366

Order Now!
1-800-677-4WIN

Networking



Network CD-ROM Drives with OPTI-NET!



Bring CD-ROM networking to your existing Local Area Network with OPTI-NET, a complete family of CD-ROM networking software products. Supporting

NetBIOS® and Novell® IPX®/SPX® networks, there is an OPTI-NET version perfect for your LAN-OPTI-NET for MS-DOS, OPTI-NET NLM, or OPTI-NET VAP!

Just released - Version 2.1 for DOS! New features include Extended Memory (XMS) caching capability at the OPTI-NET networked CD-ROM user workstation!

Online Computer Systems, Inc.
20251 Century Blvd. Germantown, MD 20874
800-922-9204
Flash Fax Information Hot Line: 301-601-2120

Utilities



"...next best thing to having a resident file recovery expert" Infoworld

**dSALVAGE
PROFESSIONAL**



for xBASE
file recovery

PCWEEK Analyst's Choice
For dBASE for dXII, Clipper etc.
\$199.95 - \$6.5H (US) check/VISA/MC
dSALVAGE PROFESSIONAL: 800-456-7005

Comtech Publishing Ltd

Box 12340, Dept M, Reno, NV 89510
INFO: (702) 825-9000 FAX: (702) 825-8118

Communications



Unattended File Transfers from your MVS or VM System Outbound - for Windows



Designed for MVS, VM, and unattended PCs, Outbound runs on your mainframe - submitted from your scheduler, another program, TSO or CICS - so file transfer is fully automatic and consistently reliable.

- Perfect for repetitive file transfers, software distribution.
 - Supports EXTRACT, PC2370, IFMAY, etc.
 - Transparent host access to Windows®, DOS and OS/2®
 - Secure - users require no TSO or CMS access.
 - Uploads or downloads data, programs, reports, and more.
 - Installs Windows and Windows applications from your mainframe.
 - Executes DOS, OS/2 and Windows commands on remote PCs.
 - Wildcards - transfer entire PC directories with attributes.
 - Free 30-day trial on your system.
- Freight Computer Company 480 Green Street San Francisco, CA 94133
800.825.7228 or 415.398.7228 (outside N. America)

Asset
Management

Cost Effective Inventory and Help Desk Software



The Inventory program is a comprehensive software package that manages computer assets and purchases. The Data Capture software automates the data collection task for the inventory

module. The Trouble Log program allows users to track and resolve support calls and inquiries while logging common problems. Full reporting capabilities and utilities are included. Multi-user Network version and source code are available.

Call or fax us for a FREE Working Demo.

ConsulNet Computing Inc.
51 Paper Birch Dr., Don Mills, Ontario
CANADA, M3C 2E6
(416) 441-0363 FAX (416) 449-1985

Utilities



CAPTURE YOUR SCREEN



PrintScreen™
is THE One-Step
Screen Image Utility
for copying OS/2 PM
Screens.
can View, Print &
Save PM Clipboard
Contents!
has a Time & Date
Display!
is a Screen Blanker!

- Copy: active or selected window, active or selected client area, selected rectangle, or entire screen.
 - Save copy to PM Clipboard or to file formats: PM Metafile, PM Bitmap, PCK, TIFF, GIF, WPG.
 - "Color Mapping" feature provides the control needed to produce quality printed output.
 - Supports 8014, XGA, SVGA, VGA, EGA - 16 & 256 color.
 - Includes both OS/2 1.3 (16-bit) & OS/2 2.0 (32-bit) Versions.
 - \$115 + VISA/MC/COD
- Phone: (918) 357-1628
Fax: (918) 357-2889

MITHRO Software
28411 E. 56th Street
Broken Arrow, OK 74014

Utilities



AutoImport 2.1 Moves Data from Mainframe Reports into PC Spreadsheets and Databases



Translates into:
Lotus 1-2-3
Symphony
Excel
Quattro
dBase
Clarion
Delimited & more

- Selectively imports only needed data
- Adds data into existing spreadsheets or databases
- Inserts @ formulas for subtotals into spreadsheets
- Can run automatically from a menu or batch file
- Easy to use visual interface with point & click operations
- Includes a TSR program to redirect printer output to a file
- Reads and translates headings, titles, %, signs, dates, international formatting symbols and more

SPALDING SOFTWARE, INC.
154 Technology Parkway, Suite 250
Norcross, GA 30092

\$189 single user
For free demo or
upgrade info call
(404) 448-1634



GMM Sync/CCP™

PC/AT Four Port Communications Coprocessor

- High Performance 16 MHz 16 bit Microprocessor.
- 80386 code compatible
- 4 Sync/Async Ports
- (2 Serial Ports with Full Duplex DMA).
- Uses Zilog 85C30, 85230 SCC chip
- 6250K Dual Ported Ram (Standard)
- (1, 2, or 4 MEG Dual Port Ram - optional).
- 8k, 16k, 32k, 64k Window Size (Programmable).
- 9 Software Selectable and Shareable Interrupts.
- RS232/RS422/RS485
- SOURCE CODE DEBUGGER Kit Available

Other PC/AT & PS/2/PCI 80386 based products available.

OEM AND DEALER INQUIRIES WELCOME

Extremely Competitive Pricing.

Call or fax for additional information.

GMM Research Corporation

(714) 752-9477 Fax (714) 752-7335

1802 Sky Park South Unit E, Irvine, CA 92714



"486-50 Power Board"

- 64K/256K/512K Cache, Intel CPU
- Speed: 247 MHz, AMI BIOS
- Price: \$845 (BABY), \$885 (FULL)

"Power Board"

- 486-50 EISA W/CPU: \$1095
- 486-50 Local Bus W/CPU: \$585
- 486-33 EISA W/CPU: \$565
- 486-33 CACHE W/CPU: \$585
- 386-40 EISA W/CPU: \$255
- 386-33 EISA W/CPU: \$245
- 386-25 BOARD W/CPU: \$190
- 386-25 BOARD, NO CPU: \$135
- 386SX-25 BOARD W/CPU: \$135
- 1 MB SIMMS 70MS: \$32

• One Year Warranty on all parts.

Associates Computer Supply Co.

3644 Tibbett Avenue

Riverside, New York 10463

(212) 543-3364 FAX (212) 548-0343



9-TRACK AND 3480

Rock solid solutions for PCs and workstations.

Rock bottom prices.

- Exchange data with minis & mainframes
- Reliable, lightweight, compact, 1600 and 6250 bpi 9-track solutions manufactured by Overland Data
- PC solutions include the latest Overland Data controllers and DOS software
- A variety of workstation platforms are also supported

Call now: 800-729-8725

Overland Data Inc. since 1980

(619) 571-5555 FAX: (619) 571-0982

Europe: (+49) 6172-35027 FAX: (+49) 6172-35028

3480 Now With IDRC!



Starter Packs Only \$79

A complete series of over 50 effective, ready-to-teach courses for today's leading PC software packages. Introduction to advanced classes in Lotus, WordPerfect, Windows plus many more!

Call For Your FREE Catalog

800-829-4ACT

In California: (213) 388-0551

Fax: (213) 388-2942

Accelerated Computer Training, Inc.

3255 Wilshire Blvd., Suite 903

Los Angeles, CA 90010



PORTABLE BAR CODE READER

for PCs, Mac's, & Serial Computers

In minutes even novice programmers can master this simple but powerful portable reader. Superwist 2x16 display. Big rubber keys. Two built-in inventory programs or 3 of your own. Wand, CCD, or Laser scanner input. Lookup tables. Double duty as a non-portable reader. Uploads thru keyboard or COM port. Xmodem for remote. Complete with steel wand-\$799. Nothing else to buy. 2 year warranty. Direct from mfr. 30 day \$\$ back.

WORTHINGTON DATA SOLUTIONS

3004 Mission St., Suite 220

Santa Cruz, CA 95060

(408) 458-9938 (800) 345-4220



LABEL AND BAR CODE PRINTING

On Epson, OKI, IBM, and LaserJet printers

print BIG TEXT Readable at 100 feet.

Bar Codes: ANSI, MIL-STD, 2of5, MSI, UPC/EAN, 128, Code 39. Many formats such as K-WART, SEAS, included. EZ WYSIWYG label design. Any size. Flexible format. Print PC images. Drive LaserJet at max. File input. Above labels printed with LabelRIGHT™ - \$279.

Other menu-driven programs from \$129. Also "callable" programs any MS-DOS language - \$179. 30 day \$\$ back guarantee. Same day shipping.

WORTHINGTON DATA SOLUTIONS

3004 Mission St., Suite 220

Santa Cruz, CA 95060

(408) 458-9938 (800) 345-4220



BAR CODE READERS for PC, AT, PS2,

Macintosh and RS-232 Terminals

Rated #1 by independent review. Reads bar

codes with No software changes needed. Acts

as 2nd keyboard. All IBM PCs, Macs, & RS-232

terminals. Reads 1D, 2D, Code 39, Code 11, MSI, UPC/EAN, 128, Code 39. Input from wand,

CCD, slot badge scanner, magnetic stripe and

laser scanners. 100+ configurable options.

Complete with stainless steel metal wand

\$399. Direct from the manufacturer. 2 year

warranty. 24 hour turnaround on repairs. 30 Day

\$\$ Back Guarantee. Same day shipping.

WORTHINGTON DATA SOLUTIONS

3004 Mission St., Suite 220

Santa Cruz, CA 95060

(408) 458-9938 (800) 345-4220



Magnetic Stripe Card Reader

New low cost Magnetic Stripe Card

Reader. Reads all popular credit cards.

Data appears to have been keyed. Two

models: 1) attaches as 2nd keyboard on

PC, XT, AT, or PS/2; 2) attaches in-line

between local and RS-232 terminals

(Wyse, Krimton, Link, etc.). Track 1, Track

2, or both. Configuration is by dip switch;

no bar code wand required. Same day

shipping. Free UPS Blue in US. Warranty

is for 2 years, 30 day money back

guarantee. Complete units from \$219.

WORTHINGTON DATA SOLUTIONS

3004 Mission St., Suite 220

Santa Cruz, CA 95060

(408) 458-9938 (800) 345-4220



9 TRACK TAPE 3480 CARTRIDGE

CONVERSION SYSTEMS

IBM DEC SUN PC

Read and Write any 9 track tape or 3480 tape

cartridge with any PC (DOS/Unix).

9 track tape subsystems:

1600 Bpi from \$1395.00

6250 Bpi from \$2595.00

3480 Cartridge from \$9,995.00

Call today for the best data conversion

systems available.

(800) 595-8856

(714) 586-3010

Laguna Data Systems

23151 Alcatraz Drive, Ste. B-3

Laguna Hills, CA 92653

FAX: (714) 586-5538



NEW...MULTICOLOR MARKER FOR

LCD/PROJECTION SYSTEMS

Get your point across using the Magic Pointer-

250 (combination electronic marker, chalkboard,

tablet and pointer), by overlaying freehand

creations on any computer-generated

projection. The 100% hardware system comes

complete with cables for plug and play action.

Features include eight color selection,

transparent, blinking, erasing and variable line

width. Supports all analog computer display

systems.

\$995.00 Includes UPS 2nd Day Air

Educational Discounts Available

Dealers Welcome

Applied Computer Systems, Inc.

3060 Johnson-Lucas Rd. Johnson, OH 43031

Phone: (602) 271-5465 • Fax: (614) 892-4838



9-TRACK TAPE FOR THE PC

Exchange data between your PC or

Macintosh and any mainframe or mini

computer using IBM compatible 1600 or

6250 BPI 9-track tape. This unit can also

be used for disk backup. Operates at

transfer rates up to 4 megabytes per

minute. Available in 7" or 10 1/2" reel sizes.

Systems include tape drive, cables, and

software. Call us today!

WORTHINGTON DATA SOLUTIONS

3004 Mission St., Suite 220

Santa Cruz, CA 95060

(408) 458-9938 (800) 345-4220



CUSTOM IMPRINTED KEYS

Customize Your Keyboard with

SnapCap KeyCaps and Replacement

Keys for IBM imprinted to your exact

specs. Available in a variety of color and

imprint colors. Many brands supported.

• Cut training costs •

• Boost productivity •

Many other keyboard enhancements

available. Call for your FREE Catalog!

HOOLEN CORP.

P.O. Box 230, Dept. INFO

Corvallis, AZ 86325

(602) 634-7515

(800) 937-1337

BAR CODING

BAR CODE READERS
AMERICAN MICROSYS2190 A Regal Pkwy. • Euless, Texas 76040 • (817) 571-9015
FOR PC, XT, AT, PS/2 & TERMINALS:

- No software changes required
- Data appears as keyboard input
- Reads Code 39, 1-25, UPC/EAN
- Codabar, 128, 93, 11, MSI/Plessey
- Auto-discriminates between codes
- Accepts WAND, SLOT, CCD, LASER, MAG STRIPE



BAR CODE PRINTING SOFTWARE:

- For Epson, DKL, IBM, Dot Matrix and HP LaserJet Printers
- Prints Code 39, 1-25, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey
- Easy to use

(800) 648-4452 • FAX: (817) 685-6232
30 Day Money Back Guarantee
One Year Warranty

WORTHINGTON DATA SOLUTIONS
Label and Bar Code Printing
800-345-4220
See ad in Showcase

WORTHINGTON DATA SOLUTIONS
Bar Code Reader
800-345-4220
See ad in Showcase

COMPONENTS



ULSI Co-Processors

3875X-25/33 \$59 / \$62

387-33/40 \$65 / \$79

Cyrix Co-Processors

3875X-25 \$69

387-33/40 \$79 / \$82

Intel Co-Processors

287 XL \$39

3875X (16-25) \$79

387-33 \$76

SIMMS/DRAM

4x9-70/60 \$129 / \$140

1x9-70/60 (3) \$29.50 / \$31

1x9-70/60 (9) \$33 / \$33

1x1-70 \$3.75

256x4-70 \$3.85

PS2 512x36 (2MB) \$55.00

PS2 1x36 (4MB) \$120.00

HP LASERJET 2P/3

2 MB / 4 MB \$79 / \$135

Prices Reflected 3%

Cash Discount

CALL: (619) 268-4774

Fax: (619) 268-0874

9541 Ridgehaven Court

San Diego, CA 92123

INFOMARKET

DIRECT CONNECTION
GIVES YOU
THE BEST
CAREER
AND
BUSINESS
OPPORTUNITIES.

PUT IT
TO WORK
FOR YOU!

COMP. SYSTEMS/HDRWR.

PANELIGHT DISPLAY SYSTEMS, INC.
LCD Projection
800-726-3599
See ad in New Products

WORTHINGTON DATA SOLUTIONS
Magnetic Stripe Card Reader
800-345-4220
See ad in Showcase

BOFFIN
External PC-Video Converter
612-894-0595
See ad in New Products

BOXLIGHT CORPORATION
Software Projectors
800-497-4009
See ad in New Products

LAGUNA DATA SYSTEMS
9-Track
800-266-4827
See ad in Showcase

Reach the professional computer buyers who make volume purchasing decisions. Place your ad in InfoMarket call (800) 227-8365.

WORTHINGTON DATA SOLUTIONS
Portable Bar Code Reader
800-345-4220
See ad in Showcase

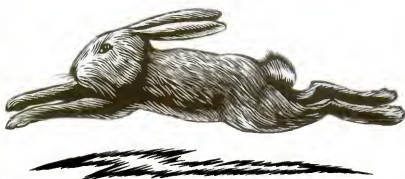
ASP COMPUTER PRODUCTS, INC.
Snap II
800-445-6190
See ad in New Products

BOXLIGHT CORPORATION
ColorShow
800-497-4009
See ad in New Products

QUALSTAR CORPORATION
9-Track Tape for the PC
(818) 882-5822
See ad in Showcase

COMPUTER SYSTEMS/HARDWARE

NOW BACKPACK IS SMALLER. AND FASTER.



We've just made it easier to backup your hard drive with our 250 MB parallel port tape backup unit. One model works with all PC compatibles and portables.

Here's why:
Backpack is easy to install.
Plug Backpack into the parallel printer port. Then plug the printer into Backpack!
Backpack requires no cards.

Backpack is 30% smaller (1.5" h x 4" w x 7.75" l).
Backpack is easy to transport and share between computers (2.5 lbs).

Backpack can backup at a speed of up to 9 MB per minute.
Backpack is a QIC 80 compatible and can read QIC 40 tapes.
Backpack is available in 3.5" and 5.25" diskette, tape and hard disk models.

So don't get left in the dust. Call for more information today.
Micro Solutions, 132 W. Lincoln Hwy., DeKalb, IL 60115, 815-756-3411, FAX: 815-756-2928



backpack
MicroSolutions
Computer Products

COMPUTER SYSTEMS/HARDWARE

IT DUPLICATES EVERYTHING EXCEPT YOUR EFFORTS.

A lot of you goes into that floppy diskette. It doesn't matter if you're developing software, creating templates or writing macros. There's buckets of sweat, hundreds of hours.

It's all worthwhile until you have to spend more hours in front of your PC making dozens of copies. Disk by disk by disk.

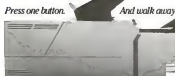
Introducing DiskTracer II. The desktop duplication system that copies hundreds of diskettes an hour. Formatting, duplicating, and verifying every last data bit.

Whether it's IBM, Macintosh, Atari, or UNIX, the system automatically adjusts to the

format of your original disk. All you do is stack the blank disks, push a button and go about your business. If only VCRs were this simple.

Of course, it's not surprising this solution comes from Trace. Our large industrial systems are used by virtually every hardware and software company in the world.

So call Trace at 800-872-2318 today. And quit duplicating your efforts.



Press one button. And walk away.

©1992 Trace. All trademarks are property of their respective holders. Fax us at 404-441-3399 or write to Trace, Dept. B, 1040 East Briarwood Road, San Jose, CA 95131.

MEDIA CONVERSION

QUALITY CONVERSIONS
TAPE ↔ DISK ↔ SCANNING
Word Processors, Micros, Minis,
Main Frames, Typesetters...
(Customized Programming Available)

IBM, APPLE, LANTIER, MICRO, CPT, MICOM, SPREADSHEETS, WANG, NBI, UNIX, DATABASES, XEROX, EXODON, XENIX, MAILISTS, DEC, SYMAC, CP/M, 286, OTHERS, CARTRIDGES

Optical Filing Systems

Run Computer Services Inc.
1261 Broadway, Ste. 904 New York, N.Y. 10001
Phone: (212) 279-0000
Fax: (800) 833-2207

CONVERTING YOUR DISKETTES?

ENTRUST THEM TO US
2500 Word Processors & Computer formats 3 1/2", 5 1/4", 8" DISKS, MAGTAPES, MAGCARDS, 3496, CARTRIDGES, CASSETTES, JAMM

DISK DUPLICATION
OCR SCANNING SERVICES
Customized conversion tool
Call us for quality, best prices and quickest turnaround time

COMPANY COMPENDIA, INC.
(800) 574-DISK
or (312) 415-8771 FAX: (312) 419-1380

DATA CONVERSIONS
SNOIS3ANOO VLYA
• Data Base & Word Processing
• Disk & 9 Track Tape
• Displaywriter/Wang
• IBM, Macintosh, Apple II, III, SYS, 3x
• FREE SAMPLE CONVERSION

800-662-6088
SYNERGY DATA CONVERSIONS
841 Shirley Ave., P.O. Box 515
Park Ridge, IL 60068-0515
708-698-4673

InfoMarket gives you the best business opportunities. Put them to work for you.

InfoMarket gives you the best business opportunities. Put them to work for you.

NETWORKING

CYBEX CORPORATION
Commander
205-534-0011
See ad in New Products

CYBEX CORPORATION
PC-EXTENDER PLUS
205-534-0011
See ad in New Products

QUALITY CONVERSIONS
OVER 3000 FORMATS
FREE TEST CONVERSION QUICK TURNAROUND
MICRO, CPT, DISKETTES
WORD PROCESSORS - TAPE
OCR SCANNING - CARTRIDGES
DISK & TAPE DUPLICATION
CALL FOR LOWEST PRICES
ALL DATA CONVERSIONS - 3009 PHILADELPHIA CT
SAVITRY HARBOR, IL 3400, 810 70C-3401
800-955-5245

DATA CONVERSION
DISKS, TAPES, CARTRIDGES
OPTICAL SCANNING
DISKETTE TAPE DUPLICATION
HDC CONVERTS DATA DOCUMENTS BETWEEN WORD PROCESSORS THEN ANYONE ELSE!!!

WORD PROCESSORS, MICROS
MINIS, DATABASES, MAIL LISTS
ACCOUNTING DATA

IBM, DEC/VAX, APPLE, WANG
WordPerfect
Lotus, Dbase
MICOM
CPT, Lanier
Mac, NBI
DISPLAYWRITER
AS/400, XEROX, CP/M, UNIX ...

NATIONAL DATA CONVERSION INSTITUTE
8 East 16th Street, New York, NY 10003
(212) 463-7511
AMERICA'S LEADER IN DATA CONVERSION

DATA CONVERSION
If you want the most complete conversion services in the industry, just call...
(800) CONVERT
Capabilities include over 3000 formats.

PIVAR COMPUTING SERVICES, Inc.
105 Arlington Heights Rd. #1
Buffalo Grove, IL 60089
(708) 459-0010

INFOMARKET EVERY WEEK

CALL (800) 227-8365

THE MOST TRUSTED PLACE FOR VOLUME BUYERS. . . AND SELLERS

SERVICES

CORPORATE DISK COMPANY™
CD TECHNOLOGIES, INC. • CD MARKETING, INC.



DISKETTE DUPLICATION

"THE ONE STOP SHOP FOR SOFTWARE DEVELOPERS"

STOP going to 5 different suppliers! It can all be done with one easy phone call.

Our Services Include:

- ▶ Printed Diskette Sleeves
- ▶ Printed Diskette Labels
- ▶ All Forms of Software Packaging
- ▶ Printed Documentation Pages
- ▶ Silk Screened Diskettes
- ▶ Duplication Equipment
- ▶ Low Cost Diskettes

ALL MASTERS CHECKED FOR VIRUSES

"You have to make but one phone call to the Corporate Disk Company and consider the job done"

**In Illinois (708) 616-0700
Nationwide 1 (800) 634-DISK**

1992 by CD Marketing Inc.

Diskette Duplication

- Custom Packaging
- Custom Labels
- Assembly and Fulfillment
- Superior Quality Control
- Master Verification
- Master Virus Check
- High Speed Equipment
- Low Costing

Superior Service

- Low Cost
- Skilled Personnel
- Fast Turnaround
- Customer Oriented

Perfecting, Inc.
2113 South Street/Pittsburgh, PA 15203
612-488-6120/612-488-6331(Fax)
800-845-2956 (Toll Free)

All disk formats
3-4 track tapes
1/4" Cartridges

For more
call
"Dupe Talk"
COMPANY
COMPENDEX, INC.

1-800-374-DISK
or: 312-419-8771
Fax: 312-419-1390

....Reach the volume buyers. .
Advertise in **InfoMarket.**

Desktop Video Conferencing

Call Via:
network, VidCall™ \$99
modem

Includes:
audio/video mail
file transfer

supports Video Blaster, WinTV, Video Master

MRA Associates, Inc. 703-448-5373 fax 703-734-9825
Distributor/Dealer Inquiries Welcome.

DUPPLICATION EQUIPMENT

For in-house duplication, MediaFORM is the source. We sell and service high-quality software duplication and labeling equipment. And we can tailor a complete, cost-effective system to meet your specific needs.

MediaFORM™ 800-220-1215
215-524-7600 (In PA) Fax: 215-563-3735
East, Pennsylvania 19341

Copies Both 3.5 & 5.25 Disks. Like Two Machines for the Price of One.

ATTRACTIVE DISK DUPLICATION

Formats features complete disk and tape duplication services with unmatched quality, competitive prices and technological advances. Labeling • Packaging • Distribution • Fulfillment Quick Turnaround • Full Printing Services We also sell quality bulk diskettes.

FORMATS™ UNLIMITED INC.

East Farmingdale, New York • 1800 645-6461 • (516) 249-9200 • FAX: (516) 249-9273

SOFTWARE

Turn to our Software section to discover the latest developments in the software industry, featuring:

Blue Sky Software
Comtech Publishing, Ltd.
Consulnet Computing Inc.
FireSign Computer Company
Grafpaint
Micro House

Minitor Software
NetWork World
Online Computer Systems
PC Secrets
Spalding Software, Inc.
Storage Dimensions

**415.572.7341
1.800.227.8365**

**INFO
WORLD**

NEED A COST-EFFECTIVE AD SOLUTION?
INFOMARKET REACHES THE BUYERS YOU WANT . . .
AT RATES YOU CAN LIVE WITH!
CALL (800) 227-8365 OR (415) 572-7341
AND RESERVE YOUR SPACE TODAY.

COMPUTER CAREERS

Computer Careers features competitive rates, variety of ad sizes, and convenient weekly deadlines.



For details,
contact Vic Kline at
(800) 227-8365.

SOFTWARE ENGINEERS

Imagine a company with an enviable track record for producing award-winning, market-leading products. Then imagine yourself as part of the team of top-notch engineers that produced them. Sound good?

We're looking for Software Engineers and Engineering Managers with exceptional skills and experience developing Windows, Macintosh, OS2 or DOS software, working in C++, C or Assembly language. We're especially interested in your relevant experience with commercial PC software development, file systems, compression, networking or localization.

Stac is fast-growing, healthy and publicly held. Our main product (Stacker disk compression software) is breaking sales records everywhere. We offer competitive compensation and an excellent benefits package. Best of all, (for engineers) is our small-company culture with big-company access to resources.

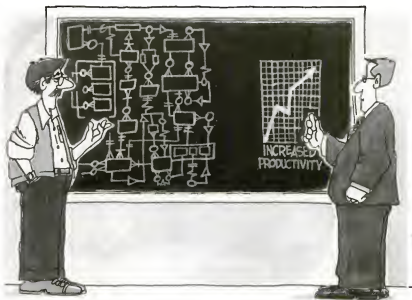
We're ideally located in the heart of sunny Southern California, San Diego's North County. We've got the best of everything—weather, beaches, mountains, parks, education, housing, entertainment, culture, and much, much more. San Diego's motto is "America's Finest City"—with good reason! Wouldn't you and your family enjoy living here?

To be considered for one of the many interesting and rewarding opportunities on Stac's engineering team, send your resume and salary history to: Human Resources Dept. TD/W, Stac Electronics, 5993 Avenida Encinas, Carlsbad, CA 92008, or FAX it to (619) 431-0271. Stac is an Equal Opportunity Employer. NO PHONE CALLS, PLEASE.

STAC

The Data Compression Company

The world's largest object lesson for both kinds of people...



Object World • San Francisco • June 14-17, 1993

Whether you're developing programs or managing projects—at the third annual Object World San Francisco, you'll gain vital practical and commercial experience. Learn from case studies of real people applying real object-oriented solutions to reduce development time, simplify maintenance, and cut costs. As the world's largest object technology (OT) conference—and the only all OT event scheduled for the West Coast in 1993—this is your opportunity to learn how to apply OT benefits to your organization.

Choose from a wide selection of conference sessions to match your experience.

Based on the technical depth that interests you, choose from three conference tracks—*Technology of Objects*, *Business of Objects*, or the *Boston University Software Developer's Track*. Each track explores key industry themes, but from a different perspective—so you can attend sessions matched to your level of experience. Case studies presented by early OT adopters help you learn how to apply OT. Plus, one-day intensive tutorials immerse you in one of five critical OT issues for an in-depth learning experience.

See products from more than 70 exhibitors.

The exhibitor list at Object World is a "Who's Who" of OT vendors. Visit more than 70 Object World exhibitors to see the newest object-oriented products and services in action.

Object World is a partnership of Object Management Group (OMG) and World Expo Corporation.



Attend presentations by Steve Jobs and other OT leaders.

Steve Jobs, Chairman & CEO of NeXT Computer, will host the second annual *Computerworld Object Applications Award* ceremony. The three keynote addresses from respected OT leaders promise to be wake-up calls for the software industry. Plus, there'll be book signings with noted industry authors, Vendor Briefings and the Object World Solution Showcase. Listen to the people who make the products and to the people who use them.

Register by April 30 and visit Object World at a discount.

For more information mail the coupon below to: Object World, P.O. Box 9107, Framingham, MA 01701-9107, or call us at (800) 225-4698. Can't wait? Fax us at (508) 872-8237.

Register for Object World by April 30—

- Get a **FREE** exhibits pass (a \$50 value)
- Save **\$100** on selected conference packages

- ☐ Please send my FREE Exhibits-Only Pass.
☐ Please send me detailed conference and tutorial information.

NAME

TITLE

COMPANY

ADDRESS

CITY/STATE/ZIP

TELEPHONE FW

EDITORIAL INDEX

Miscellaneous	
Energy Star program	23
HP/Spinload GUI/memory bundle	23
The Information Security Wishbook	29

Network Applications

CoSession 6.1	32
DP Umbrella	29
First Level Support (FLS)	29
Folio Views 3.0	29
Great Plains Dynamics	13
OnTime	29
PenAPPC	32
PenASCI	32
Remark	30
SmartScreen Message Manager	30
Utopia for Windows and SQL Server	29

Network Hardware

ASMT701 Ethernet	
Supervisor module	32
Coactive Mac-to-PC Connection	32
Fibermux FX5700 Ethernet bridge	30
Messenger 400 for DOS	29
NCD Token Ring/PCMCIA board	29
OSWare gateway line	29
Procom NU32 SECI Enabler card	29
Proline DataVault backup systems	30
Tricord's SFT30/33C and SFT30/66C server pair	29

Network Management

FrameThrower	32
LANSafe II	29
NetDirector 16.7	32
ProServe2	30

Peripherals

BusLogic disk controllers	23
Logitech Soundman board	24
Ricoh Hyperspace drives	25
Ricoh Transporter drives	25

Productivity

Cheetah 3D	13
Expert Draw	18
FileMaker Pro 2.0 for Windows	13
Lucid 3-D	13
QTrack Corrective Action and Inspection System	13
Renaissance CS Series	13
SPSS for Windows	18
Stanford Graphics 2.1	16
YourWay 3.0	17

Systems

ALR Evolution IV systems	24
IBM Powerstation line	23
IBM XStation 150	23
Unisys U 6000/35 system line	24
WinBook notebook system	23
Wise Decision 486se systems	23
Zeos Contenda notebook	24

Tools

Active Link	18
Common Ground	13
Dexterity development system	13
DocuComp II	16
Easel Workbench 2.0	13
FileMaker Pro Translator	13
Sharpened Tools	17
XFaceMaker 2.0	13
WidgetLibrary	13
ZyImage for Windows	13

ADVERTISING SERVICE REGIONS

Stan Vancour
Senior VP/Associate Publisher
(415) 572-7341

Northern California
Pacific Northwest

Joe Kernen
VP Western Advertising Director
Jan Davis
Sales Administration Manager

Alex Douma
Regional Manager/No. Calif.
Kelly Nadir
Account Manager/No. Calif.

Ron Hall
Regional Manager/
No. Calif. & Utah

John Masi
Account Manager/
No. Calif. & Utah

Steve Maylan
Regional Manager/
No. Calif. & Washington

Michael Hamilton
District Sales Manager/No. Calif.
Washington, Oregon & Utah

Kelli Rangan
Account Manager/
No. Calif. & Washington

155 Bovey Road, Ste. 800
San Mateo, CA 94402
(415) 572-7341

Southern California
Los Angeles, Santa Barbara

Karen Nies
Regional Manager

Debra Wright
Account Manager

11835 West Olympic Blvd., Ste. 1055
Los Angeles, CA 90064
(310) 512-8018

Orange County
& Colorado

David Proenneke
Regional Manager

Susan Egan
Account Manager

18008 Sky Park Circle, Ste. 145
Irvine, CA 92714
(714) 250-1305



Central

Renee Hicks
Regional Manager

Sheila Hurnvich
Account Manager

14651 Dallas Parkway, Ste. 304
Dallas, TX 95240
(214) 233-3498

Mid-Atlantic

Joanna Parker
Regional Manager

Cheryl Zuck
Regional Manager

Christine Lewandowski
Account Manager

Florence Mishaw
Sales Support Coordinator

365 West Passaic St.
Rochelle Park, NJ 07062
(201) 587-0090

Southeast

Jim Shannon
Regional Manager

Mindy Christie
Account Manager

1400 Lake Heath Drive, Ste. 330
Atlanta, GA 30319
(404) 394-0758

New England

Victor Gonin
National Accounts
Director/Regional Manager

Tania Howes
District Sales Manager

4 Chrysler Road,
Needham, MA 01930
(508) 620-7750

Special Editions
& InfoMarket

Diane Tempin
InfoMarket Advertising Director

Marc Calverico
Sharon Orr
Deanne Feigon
Vic Nims
Jennie Mcweeney
Lisa Weller
InfoMarket Sales Staff

155 Bovey Road,
San Mateo, CA 94402
(415) 572-7341

UPCOMING IN INFOWORLD

Enterprise Computing: Providing LAN Support February 15

In a multivendor environment, solid LAN support means overcoming a mind-boggling array of incompatibilities and other problems — a task orders of magnitude more complicated than PC hardware and application maintenance. In this Enterprise Computing feature, we suggest how to get the best possible support from vendors and VARs.

Networked Printers February 22

Canon's 600-dpi laser engine has added new zest to the already energized network printer market. InfoWorld's editors evaluate new printers, based on the Canon engine, from leading manufacturers such as QMS, HP, NewGen, and Compaq. We'll run them on our full-size Test Center network, challenge them to sort out PostScript- and PCL-based documents, and assess speed, output quality, and spooling capabilities.

SQL Front Ends March 1

InfoWorld evaluates more front-end application development tools for use with database servers. Building the same application with each product, we'll assess how each one handles user interface development, server connection, and setup. We'll also measure how efficiently each application queries the database, assess its overall impact on performance, and report on each front-end tool's support for multiple platforms.

Backup Hardware March 8

Complete 8mm tape backup systems ensure the safety of data on NetWare servers. The InfoWorld Test Center assesses five leading products in the category: Intel's Storage Express, Maynard's MayStream, and products from Emerald Systems, Taligent, and Emulex. We'll evaluate each one in both small (one-server) and large (four-server) network configurations, benchmark both backup and restore performance, and report on error recovery and ease of administration, as well.

Remote Control Software March 15

This software gives users at home or on the road access to applications, data, and E-mail. And it lets network administrators keep tabs on remote sites. InfoWorld reviews a half-dozen remote control software packages, including Norton Lambert's Close-Up, Central Point Software's Commute, Symantec's PC Anywhere, and Microsoft's Carbon Copy for Windows and Carbon Copy for DOS. Taking a task-oriented approach, we'll test each product running PC-to-PC over a modem and over a LAN, and we'll use each one to run applications off a workstation through a modem pool connection.

InfoWorld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 178 computer publications in more than 55 countries. Thirty million people read one or more International Data Group publications each month.

ADVERTISER INDEX

Borland	22
Computer Associates	6
Corporate Software	17
Dell Computers	26-27
ETA	33
Fifth Generation	2
Gateway 2000	46-47
IDC	31
IDG Books	58
Intel	40-41
Kingston	80
Lotus Development Corp.	10-11
Microcom Inc.	5
MicroNet Technology	28
Microsoft	14-15, 54-55
Multi-Tech	12
Northgate	79
Pioneer	43
Samtron	9
Software Publishing	19-21
Sybase/Microsoft	7

This index is provided as a service. The publisher assumes no liability for errors or omissions.

Subscribing to InfoWorld: A one-year subscription to InfoWorld costs \$130 for subscribers in the United States and \$145 in Canada. Call (800) 457-7886 or (708) 847-7925. Subscriptions to InfoWorld are available in Europe for a price of \$200 per year. By special arrangement, copies are sent by air freight to and redistributed from London, with arrival generally within three days of publication date. For more information, contact Parkway Gordon, Westwood House Publishing, Ltd., Goring-on-Thames, Reading, RG9 9BN, England. Telephone: 44 (0) 491-875386. Facsimile: 44 (0) 491-875524.

InfoWorld on CD ROM/InfoLine: You can now get full-text of InfoWorld News and Reviews on Computer Library's Computer Select CD ROM. Full text is also available through ZiffNet on CompuServe. To access ZiffNet, type go ZiffNet at the I prompt. To reach InfoWorld, call (800) 827-7889, or (212) 503-4400.

Reprints: Send all requests to Permissions Editor, 155 Bovey Road, Suite 800, San Mateo, CA 94402.

Photocopy Rights: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by InfoWorld for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per page of the article, plus \$5.00 per page is paid directly to CCC. Copyright Clearance Center, 27 Congress St., Salem, MA 01970. Please add ISSN 0199-6649. Permission to photocopy does not extend to contributed articles followed by this symbol: 1. InfoWorld can also be purchased on 35mm microfilm from University Microfilms, Periodical Entry Department, 300 N. Zeeb Road, Ann Arbor, MI 48106; (313) 761-4700.

Buyers Assurance: A standard for assuring customer satisfaction with PC products, the InfoWorld Buyers Assurance Seal is awarded only to those products that have been evaluated by our on-site Test Center and Review Board and received a satisfactory or better score in every test category. The exclusive Recommended Product is reserved for those products that have met the standard criteria and scored 8.0 or better on the InfoWorld review or product comparison. In addition, the Buyers Assurance Seal signifies that the product's manufacturer has signed a limited replacement or refund guarantee. Look for the Buyers Assurance Seal in InfoWorld reviews and product comparisons and when you are shopping for PC products.



FTC / from page 1

FTC delays action on Microsoft

bundling deals with PC makers. Ironically, this would increase Microsoft's revenue stream, according to a 34-page report by the Wall Street firm Sanford C. Bernstein & Co. Unbundling DOS would mean that users who want the operating system would have to pay extra for it, the report said.

Breaking up the arrangements would also do little to help Microsoft's competitors, analysts said.

"Maybe down the road it would allow a few more PCs to be shipped with OS/2 or DR DOS, but this would be insignificant to Microsoft's business," said Bill Whitlow, of Pacific Crest Securities, in Seattle.

Operating systems make up only 30 percent of Microsoft's

revenue, Whitlow noted.

"There really isn't much of an alternative for the mass market besides DOS," said Mary McCaffrey, an analyst with New York-based C.J. Lawrence Inc.

Currently, Microsoft charges leading clone makers a DOS license fee of \$15 to \$20 for every PC they ship.

If the FTC acts against Microsoft, the wheels of the process could turn slowly, analysts said. Microsoft legal appeals may take as long as three years, according to the Bernstein report.

"Even if [the commissioners] ask an outside court to issue a restraining order, it could take until the end of the year to take effect," said Mike Kwatinetz of Bernstein's research division.

IBM / from page 1

IBM will extend NetView

resources through the telephone company switching equipment and can use T1, leased lines, X.25, TCP/IP, or any other commercial telephone option.

British Telecom (BT), in the United Kingdom, has become the first commercial telephone carrier to announce a NetView-compliant software suite. IBM is discussing offering similar links with AT&T, MCI, and other companies from Spain, Italy, and Germany, said Bill Warner, director of enterprise management for IBM networking systems.

The BT service lets administrators view network event information—including line outages and configuration data—from BT Concert (BT's managed network services) on

IBM's NetView. The service also allows BT Concert and IBM NetView to exchange alarm and status data over an IBM Systems Network Architecture link.

Future releases this year will be capable of exchanging network performance data and generating trouble tickets between IBM and BT network management systems, Warner said. Trouble tickets are reports on the nature and time of a LAN problem.

IBM also announced NetView/6000 Entry, Version 1, a low-cost AIIX-based network manager that can manage up to 32 nodes in a small workgroup. The \$4,500 entry version is less than one-third the cost of regular NetView. The entry version is currently in beta testing

and will ship in March.

Meanwhile, NetView/6000, Version 2 is expected to ship sooner than its scheduled June ship date.

Another new NetView/6000 product manages, tracks, and eliminates problems in networks. Trouble Ticket/6000 works with existing NetView/6000 programs as well as with the forthcoming NetView/6000, Version 2, which enters beta testing this week.

Trouble Ticket/6000, Version 1 is now shipping, and Version 2 will ship June 25. Both versions are priced at \$12,500 with database access and \$10,500 without database access.

IBM also announced that starting next month the 6611 Network Processor will include Novell certification and Advanced Peer-to-Peer (APPN) Networking capability, enabling it to act as an APPN server.

Dell's Performance series snags 1-2-3 3.1

Software fix a temporary solution

BY STEVE POLIUI

Dell Computer Corp. last week acknowledged that an older version of Lotus 1-2-3 locks up when run on Dell's recently introduced Performance series of 486-based computers.

Introduced in December, Dell's Performance series causes Release 3.1 of Lotus Development Corp.'s spreadsheet to abort, according to a Dell representative.

Lotus is currently shipping Release 3.4, which apparently does not cause problems.

"A very small number of our customers have experienced this problem, and we are now putting together a software work-around," the representative said. "Because it's a problem that is somewhat rare, it's hard to recreate what these folks are experiencing," he added.

The Dell representative said the problem has not been linked to the application or the hardware, but he expects the software fix to be available

within a few weeks. Customers who are experiencing the problem should call Dell's support line.

One user, who is a network administrator at a Big Six accounting firm, discovered the bug when he bought a \$2,600 Dell 433L—a member of the Performance series—for his home.

"When I started using 1-2-3, the virtual memory problems started," said the administrator, who asked not to be named.

Dell support staff members offered the administrator a few fixes that didn't work and then told him to turn off the ROM shadowing, but doing so made the machine "unacceptably slow," he said. Finally, he spent \$134 and upgraded to 1-2-3, Release 3.4.

"We've got 25 [Dell] systems at the office and when they all finally get upgraded, we have to change out the software for another, a total of about \$2,500," the administrator said. "I find [Lotus'] response unacceptable."

DELL / from page 1

Dell to slash prices by 22 percent

Dell will also revamp its support program with new offerings, while continuing to offer one-year, on-site service for parts and labor, and lifetime phone support.

Sources said Dell is responding to a diverse market that simultaneously demands costly, extensive support options and cheaper bare-bones support.

Customers with capable in-house technical support service can eliminate the standard Dell one-year, on-site, and lifetime

telephone services, thereby reducing the system purchase price, sources said.

For organizations that want broader support choices, Dell will provide three new or expanded service options, including extending its telephone support from 18 hours six days a week to 24-hour daily service.

A new Dell SelectCare program provides a range of enhanced support options. For example, an extended parts-

only warranty for the slimline "L" model of its Performance series will be priced at \$49 per additional year. The Austin, Texas-based vendor will also offer training to companies using a third-party service provider and cut its extended on-site service prices by 50 percent.

Dell will increase the number of application software packages it will pre-install from a dozen to about 50. The cost of that service is expected to be \$15 for each number of ordered software titles.

The company declined to comment.

NEXT / from page 1

Next mixes hardware for software

would become software-driven and make systems optimized to run NextStep.

As a software company, Next will port its NextStep operating system to a variety of platforms, including the 486 and the Pentium.

On the hardware front, the company is considering several options. Next could link its hardware business entirely by selling its Fremont, Calif., factory. Or it could sell the hardware portion of its business to another company—possibly Canon Computer Systems Inc.

in Orange County, Calif.—that would keep alive the dream of a proprietary Next workstation.

In any event, there is a slim chance that the company will keep a toehold in the hardware business by reselling machines designed and produced by other manufacturers, such as a 486 box from Intel or a PowerPC system from Canon, sources said. These machines would carry the Next label on their distinctive black boxes.

Canon Inc. of Japan owns a 17.9 percent share of Next.

Analysts were unable to confirm that Next is redefining its business but received the idea enthusiastically.

"If they're turning themselves into a software company, this is probably the first really smart business decision Jobs has ever made," said Matt Cain, an analyst with the Meta Group, in Westport, Conn.

"The market for client/server tools will be huge, and the strength of NextStep is its rapid adaptation development capabilities," Cain said.

Intel and Motorola declined to comment.

—Tom Quinlan and Vance McCarty contributed to this story.

MICROSOFT / from page 1

Microsoft lures IS to NT with mail server

Microsoft's LAN-based messaging server is "at the core of our workgroup applications strategy," said Reed Koch, Microsoft group product manager for the messaging business unit.

When EMS ships by year end it will support most cross-platform networking environments

including Ethernet, TCP/IP, and X.25 transports; native X.400 and X.500 messaging and directory protocols; and all of the Open Source Foundation's connectivity remote procedure calls.

"Endorsing the X.400 and X.500 international standards is significant to Microsoft's multi-

media strategy, as X.400 is the most complete industry standard for transporting multimedia," said Sara Radicati, president of technology services at Creative Networks Inc., in Palo Alto, Calif.

The company also said it will support an emerging standard for delivering multimedia objects within an E-mail message in the next version of its Simple Mail Transfer Protocol gateway.

Microsoft will support the Multipurpose Internet Mail Extension as soon as that standard is clarified, according to Elaine Sharp, Microsoft messaging server product manager.

In addition, Microsoft's EMS will support the Asynchronous Protocol Specification Alliance's base technology when it is released this June, Sharp said.

Microsoft plans to ship a utility with EMS that will automati-

cally convert a Microsoft Mail 3.0 user's messages and folders to EMS. Although the company will not package EMS with NT, it is now considering bundling Windows NT with EMS and selling EMS client licenses separately, a source said.

Sequent Computer Systems Inc. is currently testing Windows NT on a Sequent Symmetry multiprocessor with 5,000 users on one server, Sequent said.

REVIEWS / TEST DRIVES

FIRST LOOK / from page 1

Database front end speaks users' native language

when Symantec shipped Q&A.

Q&A succeeded because it was an easy flat-file database with a usable word processor. It definitely did not succeed because of its much-touted Intelligent Assistant, which merely seemed to prove that English wasn't a practical way to retrieve data.

The problem with Intelligent Assistant was twofold. First, Q&A was memory constrained (and wasn't very good at parsing English). Also, it took longer to set up Q&A for English queries against a single database than it took to learn Q&A's query-by-forms (QBF) interface.

Because learning QBF let you retrieve data out of any database, there was no reason to hassle with training the Intelligent Assistant for a particular database.

The same situation holds for Natural Language, but more so. Training this program about your data — in effect, developing an application that understands your particular database — takes more time than it would to, say, learn Paradox's query-by-example well.

The difference is that Natural Language works against very large multiuser databases that used to live on Unix machines and VAXes but are now migrating to more cost-effective Intel servers. Because a number of people need this data, several days of a database administrator's time can easily be worthwhile because of the leverage.

Another difference is that the PC is now a more robust platform. CPUs are much more powerful, and Natural Language for Windows can ask for and get 16 or more megabytes of virtual memory.

Whereas Q&A was trying to simplify the rather

trivial problem of access

to flat files, Natural Lan-

guage tackles the much

harder problem of access-

ing data stored in a relational

model. You don't

have to know about six-

table Theta joins to find

out how much each sales-

person sold each month

of 1990 (presuming the

person who teaches Natu-

ral Language about your

database understands this

stuff).

Bottom line: Natural

Language is far faster and

far better at understanding

English than Q&A's

Intelligent Assistant could

hope to be.

As you might expect, more

memory and faster

hardware helps performance,

but the translation

from English to SQL and

then back to English so

you can check Natural

Language's parsing takes

just a few seconds.

Setting up a Natural

Language application

requires you to understand

the schema of the

database. If you don't

understand foreign

and primary keys, you

won't get very far (although

the product's tutorial is

better than most Win-

dows database products

at explaining how

relational databases are

structured).

Although this kind of task

is a natural for a data

base administrator, the

documentation for

Icon (the development

portion of the equation)

is written as if the pro-

gram expects someone

who doesn't really under-

stand databases to under-

take the task.

Natural Language knows

about things that are

generic to business, such

as employees. It can also

ask about a question such

as "What date is next

Monday?" and "How many

inches in 27 meters?"

The most basic thing you

need to teach Natural

Language about your par-

ticular data involves the

Isa ("is a") field. If Natu-

ral Language doesn't

know what something is, you need to tell it, for example, that a Ford "Isa" car.

The Isa field helps avoid type mismatches. If you have a crime statistics database, you might type in the following to determine the murder capital of the world: "How many guns killed people in Oakland?" If you'd done a good job on Isa fields, Natural Language could easily answer back "Guns don't kill people. People kill people."

As part of the teaching job, you might also find yourself renaming database attributes. For example, if Natural Language finds the attribute "description" in two different tables, it will assume, say, that "account_code description" is equal to "part_code description," which is not the case. Warnings help developers clear up such potential problems.

The development process is usually run against an extract rather than against the actual production databases. Icon has a facility for extracting a representative database subset small enough to fit in memory on the development machine.

Using Natural Language works best if you keep your questions confined to what the program knows about. But that may not be limited to column headings in the database schema. If you've defined other concepts, you can ask questions in the vernacular. For example, you can tell NL that a "star" is a salesperson who earns more than \$100,000 a year.

If you're not a terrific typist, never fear. It helps to be fast, but Natural Language can cope with a few typos; it attempts to guess the meaning of misspelled words that aren't in queries.

Natural Language also includes a report formatter and a rather annoying graphing tool. For other Windows applications (Excel, Quattro Pro, etc.) can easily send up your data once you've retrieved it.

Ultimately, getting what you want from Natural Language is probably easier than hiring a SQL programmer and having him or her translate your English-language requests into queries. Programmers might be better at understanding your English, but they would doubtless be for reading your request back to you.

For the time being, teaching Natural Language about your database has to be done on a Unix or VMS workstation; the entry-level price for a Sparcstation is \$4,950. The Windows development environment, expected in the third quarter, will be priced lower but will be compatible with other high-end client/server development tools.

The Natural Language client software for Windows is currently shipping for \$595 list, with volume discounts available. The product supports Sybase and Oracle databases in the box, with Ingres and Informix support expected soon. Natural Language supports Microsoft's SQL Server through Microsoft's SQL Bridge product, which can handle the Unix-to-OS/2 protocol problem. However, the Sybase NLM product's support of simultaneous IPX/SPX and TCP/IP stacks makes it a more likely development environment for PC LANs.

Natural Language Inc., in Berkeley, Calif., can be reached at (800) 654-5558.

Kevin Strehlo is executive editor of testing and reviews. First Look examines new products before they have been through a formal review.

INTEGRATED SOFTWARE

FORD'S FEATHERS

Species: Red-Tailed Amazon
Country of Origin: Brazil

The Red-Tailed Amazon will make a wonderful addition to any bird lovers collection.

Endangered FALSE Price \$900.00

Customer ID: 62341 Sales Order No: 95362
Name: Jason B. Witherby
Address: 345 South Hill St.
City: Los Angeles State: CA
Phone: (714) 345-3456
Balance: \$0

Terms: COD
Purchases: \$900.00
Payments: \$900.00

Ship: FID Order: FID Serial: 011-FID

With Open Access IV, graphics images can now be captured, stored, and printed directly inside database memo fields.

Open Access for DOS gains speed, power

Database includes SQL-like queries

By PATRICK MARSHALL
CONTRIBUTING EDITOR

With its relational database, powerful spreadsheet, built-in E-mail, and strong communications, Open Access has long been one of the more powerful DOS integrated programs for networks. Now, with the release of Open Access IV, the program is stronger than ever.

As before, the program has five main modules — database, spreadsheet, word processor, communications, and programmer — supplemented with a pop-up set of desk accessories.

But Software Products International Inc. has added a host of enhancements to the new version. To begin with, most of the application modules received a speed boost, and the program's menus are now user-configurable.

Among the program's modules, the relational database has received the most attention in this upgrade: Not only was it made faster, it was also improved with SQL-like queries and the capability to search for text in memo fields.

The word processor now can handle 25 file formats and has the capability to wrap text around an inserted graphic.

Finally, the Programmer module, which can be used to generate new applications, now has an integrated compiler.

Those are just the highlights of the enhancements users of earlier versions will find.

Those who are not familiar with Open Access should keep in mind that it is all business, and not for the casual user. The program is powerful but not very user-friendly (e.g., it often lacks on-screen prompts for commands).

Although all the applications reside in one package, you can only run one at a time. There is no windowing of your spreadsheet over a word processor document, for example. And you can forget about WYSIWYG file displays.

If, however, you're looking

If you're looking for a package with a robust database and spreadsheet, Open Access is for you.

for a network-compatible integrated package with a robust database and spreadsheet, Open Access could be the end of your quest.

The program is fully compatible with NetWare, Banyan Vines, 3Com 3+, Invisible Network, and any NetBIOS-compatible LAN.

Open Access lists for \$595. Users of Open Access II and III can upgrade for \$149 and \$129, respectively.

Software Products International, in San Diego, can be reached at (800) 937-4774.

DESKTOP PUBLISHING SOFTWARE

PageMaker 5.0 catches up with Windows DTP

BY GALEN GRUMAN REVIEW BOARD

Windows users have seen Aldus Corp.'s PageMaker 4.0 age as their Macintosh counterparts got an interim upgrade (Version 4.2) and rival Quark delivered the powerful QuarkXPress for Windows 3.1. But PageMaker 5.0 is soon to be delivered, probably this spring, although Aldus says in midwinter, and it will offer significant improvements and additions.

I looked at beta Version 1.0 of Windows PageMaker 5.0. An identical version for the Mac is also due shortly (a month or two) after the Windows version is released, and a demo shown to *InfoWorld* proved that they are as identical as possible given platform difference.

PageMaker 5.0 will have many of the functions that QuarkXPress users have had, such as a library to store commonly used text and graphics elements; a control palette for applying most basic formatting to text and frames without wandering several layers deep into pull-down menus; text rotation, slanting (skewing); and mirroring (to 1/100th of a degree).

There will also be a host of small enhancements, such as the capability to control how font names are handled in

publications that are moved to and from the Mac.

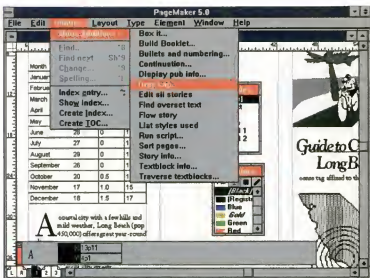
PageMaker's new features focus on the high-end user and on ease of use. The basic features, such as style sheets, text wrap, and indexing, remain the same, but Aldus added running headers and footers for use in long documents.

PageMaker 5.0 continues to have fuzzy typographic controls over tracking and kerning — high-end users will be disappointed that there are still only the vague "very loose" and "tight" settings from which to choose. Also, you still can't click a window shade (a frame that holds text) and change it from one to three columns, for example. However, you can now rotate text blocks in any angle and skew them.

Multiple paste is another new feature and lets you paste several copies with user-defined spacing in between.

Typographically, PageMaker has added an option for whether a paragraph may break and lets you specify baseline shifts for paragraph styles. Some graphics features have been enhanced. You can now define custom rules and are no longer limited to a fairly small selection. And there are now extra views.

A few changes simply make PageMaker a current Windows application.



New to Windows users, Aldus' Additions technology lets third-party developers add missing or specialized capabilities to PageMaker 5.0.

One is the capability to have multiple documents open, and another is support for Object Linking and Embedding.

Aldus has added a facility called Additions (similar to QuarkXPress' XTensions), which let third-party developers add specialized features. Aldus will include a set of 20 Additions, including searching for overset text.

Aldus has significantly enhanced Version 5.0's output. You can now specify

any noncontiguous pages to print. Also, color separation is now built in.

Almost all these new features already exist in QuarkXPress. However, PageMaker 5.0 makes the product a lot stronger, and it will hold its own for the business publisher who doesn't care about color or superprecise typography. PageMaker 5.0 will list for \$895.

Aldus, in Seattle, can be reached at (800) 627-8880.

MACINTOSH DISK UTILITY

Public Utilities decreases data brownouts

BY JEFF ANGUS REVIEW BOARD

Because Macintosh hard disks are more likely to experience minor breakdowns, every serious Mac manager needs a set of good disk utilities. Fifth Generation Systems Inc.'s Public Utilities may be the solution.

Version 1.0 revolves around five utilities. The most unusual feature is Prevention — a Control Panel device that tests disk media and file integrity in the background.



Public Utilities' Optimize Disk feature will defragment your hard drive but won't overwrite deleted files.

Repair Disk includes a Salvage feature that recovers data from files or parts of files from erased or crashed drives.

Repair File lets you recover data from a file on a bad disk file. Undelete File recovers files you've thrown into the trash. And Optimize Disk lets you defragment your disk but will not write over the deleted files.

Fifth Generation provides installable versions for both System 7 and 6.0.x, and gains

kudos for including Emergency Disks (other copies on floppy).

Public Utilities, overall, is well designed. It's pretty standard stuff, but it works. I jimmied into some files and "broke" them. Repair File identified three files as requiring repair and was able to partially recover two while acting the last.

Undelete File was a little less effective. I deleted 21 files, rebooted, and Undelete File found only seven of the files, all of which the utility recovered perfectly.

The outstanding feature of this package is the documentation. It includes a thorough dissertation on the nature of Mac hard drives, file systems, system software, and potential errors. The information is valuable, elegantly written, and usable. The on-line help is a plus, as well.

Public Utilities (\$149) provides some notable improvements over other disk utilities. If your site experiences any level of hard drive problems, this package deserves your strong consideration.

Fifth Generation Systems, located in Baton Rouge, La., can be reached at (800) 873-4384.

WINDOWS FILE UTILITY

Outside In adds support for graphic file formats

BY PATRICK MARSHALL
CONTRIBUTING EDITOR

Systems Compatibility Corp.'s Outside In 2.0 fills a sorely felt gap. It simplifies file searching and viewing from within Windows applications.

As with Version 1.0, you can view dozens of types of word processor, spreadsheet, and database files (Macintosh, DOS, and Windows) from within your word processor. You can locate files by any combination of file specification, path, and character strings contained in the file. And you can cut and paste data from files into other applications.

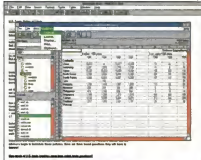
New Version 2.0 can handle graphics file formats, including TIF, GIF, BMP, and EPS (with TIF headers), as well as formats for CorelDraw, Micrografx Designer, and fax group III. There is no JPEG support. The program also lets you view Zip files.

Outside In can now handle file management tasks on the fly, such as copying, renaming, or deleting files.

Finally, the program integrates into the major E-mail programs, including Microsoft Mail, ccMail, Da Vinci eMail, and WordPerfect Office.

Outside In 2.0 lists for \$89. Version 1.0 owners can get a free upgrade.

Systems Compatibility, in Chicago, can be reached at (800) 333-1395.



You can open Outside In from within a word processor and view an Excel file.

Carberry ushers in venture capitalism, Big Blue style

When Bob Carberry joined IBM, he probably never thought IBM would have to report losses or that he'd end up being a venture capitalist. But that's pretty close to what is happening. Last month, Carberry was chosen to run the Fireworks Project, a collection (or "portfolio," Carberry says) of multimedia companies that IBM takes an investment interest in. Central to Fireworks' current portfolio is Kaleida's Script-X, the multimedia scripting language that is supposed to cross a variety of platforms and give rise to new multimedia applications.

It is venture capital, Little Blue style. So far, Fireworks has signed up a multimedia production studio that will produce Script-X titles and announced a real-estate information service. Tom Quinlan, InfoWorld's senior editor for hardware, talked with Carberry last week at Demo '93.

InfoWorld: Is the Fireworks structure unique to multimedia, or could this represent a shift in the way companies sell technology?

Carberry: I think it could be a general model. There is a notion of the "virtual corporation" — that people will tend to get together in ventures, regardless of other relationships, to go after a specific opportunity. This is certainly a step in that direction. In Fireworks' case, I would not paint that general of a picture to start with. We have a very specific notion of the area that we want to work in.

InfoWorld: IBM has had a reputation as being a somewhat fickle business partner. How confident are you that this is

a model that IBM is committed to?

Carberry: Partnerships are very key to how we do business. I suggest that you take a contemporary view over the last couple of years. The relationships we have put together — with Apple and Motorola — have been thoughtfully constructed, the people well motivated.

InfoWorld: It's fairly easy for a computer company to judge success based on sales. How are you going to be judging the success of Fireworks over the short term and over the long term?

Carberry: In the near term, I think you'll see new business partners joining us. Perhaps as soon as in six months — certainly over the next 18 months — you'll see other businesses added to the portfolio. Over time we would expect to be measured in terms of the financial returns for the partners — both in terms of sales and in terms of creating value through investments.

InfoWorld: IBM suggested there would be synergy between you and its traditional core businesses such as the Personal Computer Co. Will that be a criteria?

Carberry: "Criteria" — the businesses will act in their own best interest. We certainly would want to have relationships with those businesses, but only if it's the right product at the right price with the right terms and conditions. If they're not, then they're not.

InfoWorld: How independent will Fireworks be? Can you go out and develop a scripting language for Windows rather



than use Script-X if the market moved that way, for example?

Carberry: First, we likely won't do much development ourselves. We don't have a technology development group per se. We do have a technology evaluation group.

We think that the businesses that Fireworks helps form have the responsibility of going where they think the market is. There are no constraints that Fire-

works puts on the portfolio companies.

InfoWorld: You've mentioned Kaleida as part of your portfolio. Has that relationship needed some adjustment since the creation of Fireworks, and particularly in that you're one of the liaisons between the Apple-IBM joint venture?

Carberry: No. Kaleida is on or slightly ahead of schedule in defining and refining Script-X. Over the course of time we will be proactively encouraging both internal and external usage of the Kaleida technologies as they become available, and wherever we think there's an application we will move in that direction.

InfoWorld: A lot of IBM watchers have suggested that IBM would be immensely more valuable to stock holders if it were broken out into component parts. Would a project like Fireworks benefit from being a wholly separate entity, or would that even be possible?

Carberry: The current plan is that Fireworks is part of the personal system line of business. And I don't see in the near term any change in that position. You're well aware of the various parts of the PC business and the business in general are receiving more autonomy and I think that will continue.

As far as the Fireworks portfolio is concerned, almost all of the portfolio will be made up of joint ventures, of non-IBM companies. The people who work in the ventures are employees of the venture, not IBM. So that's a degree of freedom and flexibility and independence. And I'm a very happy carmaker with that relationship.

Notes From the Field / Robert X. Cringely

On the next Geraldo: Aussie scholars who play Trivial Pursuit in Redmond

Pammy has been curled up for days on the sofa, breaking in a new pair of those fuzzy pink slippers, eating microwave popcorn, and watching television for her course called "Images of Women in the American Media."

"I don't get it, Bobby," she said, turning her back for a moment to Phil Donahue while grabbing a handful of Orville Redenbacher. "Most of these women are actually men."

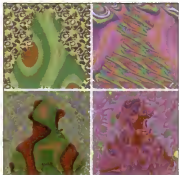
Welcome to Sweeps Week, when TV dives below the belt in search of higher ratings.

IN THE FOR THE BUCKS. Sweeps Week is when TV ratings people make an extra effort to measure the audience, pretending that these weeks are typical of the rest of the year. But TV programmers, who will do anything for an extra rating point, pull out their tactical nuclear weapons.

"Look at those neutron bombs," I said, sharing a family moment of Biker Babes on *Geraldo*.

It's cut-throat competition, pure and simple, and of course it reminds me of Microsoft, which will soon bundle its Access database in Microsoft Office.

Here's another: Load the interim (and



free!) Excel 4.0a and Word for Windows 2.0c upgrades on your dual-boot 486 running OS/2.0 and DOS 5. Now jump back to OS/2 and try to run the programs, or any DOS program, for that matter. It won't work. The error code is SYS0108 — "disk is in use or locked by another process."

Trying to handle this type of problem, IBM has been delayed yet again in its release of OS/2.1. The internal plan was to release the new OS in December, then March, now April or May.

If the kids in Redmond can't win one

way, they'll win another. At the same time they claim their Double Space utility in DOS 6 doesn't infringe the patented algorithm used in Stackcr, Microsoft has hired an Australian computer science professor to search for prior art to beat the patent. Appealing to the Internet for help, the professor clearly admits infringement, but calls it "trivial." The folks at Stac Electronics, of course, call it illegal.

JUST THE FAX. It's during Sweeps Week that major characters on dramatic series either die or get lucky. Sometimes both. Gateway 4DX2/66 users know both feelings. Load these babies up with more than 16 megs of RAM and computation slows by 30 percent and video by 75 percent.

"We never said that it worked well with over 16 megs, just that it can hold more than 16 megs," says tech support if you can get them on the phone.

Then there is Gateway's Telepath fax/modem that lots and lots of users say simply doesn't work, much less read minds.

A better alternative might be Zoom's V.32 non-fax/modem, which turns out to be the company's fax/modem, but with

one LED painted over and a \$60 lower price.

Spend the savings on ccMail quick-reference cards, which aren't included when you buy extra user packs. Lotus prefers to sell them in five-packs for \$25.

ZIPLESS. "Who watches this stuff?" "We do."

Even now, we care about it. Viewers actually know about Sweeps Week. TV newscasters do stories on it. Time to get a life.

PKZip seems to have found a new life with its 2.04c upgrade, which fixes the earlier problems with DPMI, volume labels, and spanning multiple drives. But don't expect to use PKZip 2.04c and XTree 1.3 for Windows, which is coming this month. XTree does not support the PKZip 2.x format.

Don't expect, either, to get everything you want out of Random House Electronic Publishing's book *Publish Yourself on CD-ROM*. The included CD-ROM disk apparently doesn't work.

But then neither do I. Disturb my rest by calling (415) 312-0555 with an industry secret; fax: (415) 326-0326; MCI:CRINGE, or cringex@infoworld.com.

Lowest Price Going!



Now get a Northgate 486DX2/66 EISA for less than a Gateway!

Now you can answer your network's call for the compatibility, reliability and performance of a genuine Northgate file server – even if you have a “common clone” budget!

In fact, our Elegance 486DX2/66 EISA is priced \$300 below a comparable Dell...and \$100 below Gateway! It's fully-loaded and ready to go, too.

Of course, you get all the “peace of mind” extras including Northgate's award-winning 24-hour technical support, one-year parts and labor warranties, expert on-site service from NCR® and more.

So give your network a boost, and your budget a break. Call Northgate now!

Elegance 486 ZXP EISA Server

- Intel® i486® DX2/66 processor
- Upgradable to other i486 processors and OverDrives; supports P24-T
- 128K write-back cache; expands to 512K
- 8MB RAM; expands to 128MB
- 525MB fast 10ms SCSI hard drive
- EISA SCSI caching controller with 1MB RAM
- Tower case
- 1.2MB or 1.44MB floppy drive
- 14" SVGA color monitor
- Northgate 101-S keyboard

\$3699

Lease as low as \$126.51/mo.*

Northgate Service & Support

- 30-day money-back guarantee
- Full one year warranty on systems
- On-site service from NCR®
- Toll-free, 24-hour technical support seven days a week

Call for more information!
800-453-0076

GSA #GS00K91AGS5193 PS01

Major credit cards, money orders, direct wire and approved company purchase orders accepted.



NORTHGATE
Solutions For Workgroups™

7075 Flying Cloud Drive, Eden Prairie, MN 55344

©Copyright Northgate Computer Systems, Inc. 1995. All rights reserved. Northgate, Elegance and the Northgate "N" logo are U.S. trademarks or registered U.S. trademarks of Northgate Computer Systems, Inc. Intel and the Intel Inside logo are registered trademarks of Intel Corporation. All other products and brand names are U.S. trademarks and registered U.S. trademarks of their respective companies. Prices and specifications subject to change without notice. Prices shown are in U.S. dollars and do not include shipping and handling. Shipping is separate from sales tax. Northgate reserves the right to substitute components of equal or greater value in performance. All items subject to availability and offer a call-in the U.S. and Canada only. *Optional leasing program is based on a 36-month lease with a 3% down payment. (U.S. dollars) Leasing option available to qualified businesses. Consultation to local "Big" 100 U.S. business centers.

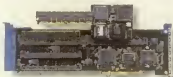
Circle 10 on Reader Service



Piece Of Mind.

It's more than simple trust. Piece of mind comes from unquestioned dedication to detail. You get it from experience...from quality. You get it from Kingston—long the best selling manufacturer of over 450 memory, processor, and data storage upgrades for PCs, laser printers and workstations. Why?

Because each and every product is bench tested in the system for which it was designed. With diagnostics written by the system's original manufacturer. A practice we have executed 5,245,608 times so far. Every time. We leave nothing to chance because, we suspect, neither do you. Call (800) 835-6575 for more product information or the name of your nearby reseller.



Kingston
TECHNOLOGY CORPORATION

THE INSIDE NAME IN UPGRADES

17600 Newhope Street, Fountain Valley, California 92708 (714) 435-2600 Fax (714) 435-2699